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THE INTERNATIONAL CYCLOPÆDIA

A COMPENDIUM OF HUMAN KNOWLEDGE

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IN FIFTEEN VOLUMES

Vol. IV

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1900

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INTERNATIONAL CYCLOPÆDIA.

CIRCULATION, in anatomy and physiology, is the term used to designate the course of the blood from the heart to the most minute blood-vessels (the capillaries, q.v), and from these back to the heart.

To simplify the consideration of the subject, we shall consider—1. The anatomy of the organs of circulation—and, 2. The physiology of the circulation.

1. The organs of C. consist of the heart, arteries, veins, and capillaries. The course of the blood through these organs will be best elucidated by the aid of a diagram, which is equally applicable for all other mammals as well as for man, and for birds. The shaded part of fig. 1 represents structures filled with impure or venous blood, while the unshaded portion represents structures in which pure, oxygenated, arterial blood occurs. In this diagram we observe a dotted circle, representing a closed bag or sac, termed the pericardium, and inclosing the four cavities *c*, *v*, *c'*, *v'*, of which the heart is composed. Two of these cavities, *c* and *c'*, are for the purpose of receiving the blood as it flows into the heart, and are termed the *auricles*; while the two cavities *v* and *v'* are for the purpose of propelling the blood through the lungs and general system respectively, and are termed the *ventricles*. The vessels that transport blood into the auricles are termed *veins*, and the vessels through which the blood is driven onwards from the ventricles are known as *arteries* (q.v.). The diagram further shows that what we commonly term the heart is in reality *two distinct hearts* in apposition with each other—one, shaded in the figure, which is called the right, or venous, or pulmonary heart; and the other, unshaded, which is called the left, or arterial, or systematic heart—the last name having been given to it, because the blood is sent from it to the general system; just as the right heart is termed pulmonary from its sending blood to the lungs. We will now trace the course of the blood as indicated by the arrows in this diagram, commencing with the right auricle, *c*. The right auricle contracting upon the venous or impure blood with which we suppose it to be filled, drives its contents onwards into the right ventricle *v*, through an opening between these two cavities, called the right auriculo-ventricular opening, which is guarded by a valve named the tricuspid—from its being composed of three-pointed membranous expansions—which almost entirely prevents the regurgitation or reflux of the blood from the ventricle into the auricle. The ventricle *v* being now filled, contracts, and as the blood cannot return into the auricle, it is driven along the shaded vessel, the dividing branches of which are indicated by *f*. This vessel is known as the pulmonary artery, and conveys the blood to the lungs. At its commencement, it is guarded by valves, termed, from their shape, the semilunar pulmonary valves, which entirely prevent the blood which has once been propelled into the pulmonary artery from re-entering the ventricle. The pulmonary artery gradually divides into smaller and smaller branches, which ultimately merge into capillaries. In these capillaries, which are freely distributed over the interior of all the air-cells (of which the lung is mainly composed), the venous blood is brought in contact with atmospheric air, gives off its carbonic acid gas (which is its principal impurity), and absorbs oxygen, by which processes it is converted into pure or arterial blood. The capillaries, *b*, in which the blood is arterialized, gradually unite to form minute veins, which, again, join to form larger vessels, until finally the blood is collected into a small number of vessels known as pulmonary veins, which pour their contents into the left auricle. Only one such vessel, *g*, is shown in the figure, because the main object of this diagrammatic scheme is to illustrate the mode and general direction in which the blood circulates not to indicate

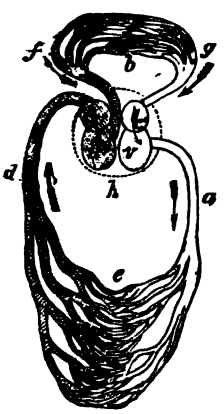


FIG. 1.—MODE OF CIRCULATION IN MAN AND OTHER MAMMALS, AND IN BIRDS.

h, heart; *v*, right ventricle; *v'*, left ventricle; *c*, right auricle; *c'*, left auricle; *a*, aorta; *d*, vena cava; *e*, greater circulation; *b*, smaller circulation; *f*, pulmonary artery; *g*, pulmonary veins.

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the special vessels through which it flows in different parts of the body. The actual number of the pulmonary veins is four—viz., two from each lung. The blood, now fitted for the various purposes of nutrition, enters the left auricle, *c'*, which by its contraction propels it into the left ventricle, *v'*, through the left auriculo-ventricular opening. This opening, like the corresponding one in the right heart, is guarded by a valve which, from its form, is termed the mitral valve, and which entirely prevents the reflux of the blood. The left ventricle, *v'*, contracts and drives its contents into the large artery, *a*, which represents the aorta—the great trunk which, by means of its various branches (none of which are indicated in the diagram), supplies every portion of the body, from the crown of the head to the soles of the feet, with pure arterial blood. From the aorta and its various subdividing branches, the blood passes into the capillaries, *e*, which occur in every part of the system; in these capillaries it undergoes important changes, which may be considered as almost exactly the reverse of those which occur in the pulmonary capillaries; it parts with its oxygen, becomes charged with carbonic acid, and, as it leaves the capillaries, and enters the minute veins formed by their union, presents all the characters of venous blood. The veins gradually unite till they form two large trunks, termed the superior and inferior *venæ cavæ*, which pour their contents into the right auricle—the point from which we started. Only one of these great veins, *d*, is indicated in the diagram. We thus perceive that there is a complete double C.—that there is a lesser C. effected by the blood in its passage from the right to the left heart through the lungs; and that there is a greater C. effected by that fluid in its passage from the left heart through the system generally to the right heart.

From the above simple ideal scheme, we proceed to the consideration of the more complicated arrangements by which the C. is actually effected in man and the higher animals.

The heart is situated in very nearly the center of the cavity of the chest or *thorax*, as it is termed in anatomy, between the lungs, behind the breast-bone, or *sternum*, in front of the vertebral column, and above the diaphragm, on which it obliquely rests. Its form is somewhat conical, the lower end tapering almost to a point, and directed rather forwards and to the left. This lower portion alone is movable, and, at each contraction of the heart, it is tilted forwards, and strikes against the walls of the chest between, in man, the fifth and sixth ribs, or a little below the left nipple. All the large vessels connected with the heart—the *venæ cavæ*, the pulmonary artery, and the aorta—arise from its base (see fig. 2), and serve, from their attachment to the neighboring parts, to keep that portion of it fixed. Indeed, these vessels may be regarded as suspending the heart in the cavity, which is lined by a smooth serous membrane, which, near the top, is reflected downwards over the roots of the great vessels, and covers the whole of the outer surface of the heart. These two smooth serous surfaces—one lining the cavity, the other investing the heart—are kept moist by a fluid which they secrete, and by this arrangement, friction may be regarded as reduced to its minimum. The cavity or sac in which the heart lies is called the pericardium. Like all serous membranes, it is a closed sac, and, as it may not be easy for the non-professional reader to understand the relative position of the heart, which is at the same time surrounded by and external to this membrane, we may observe that the head in an old-fashioned double night-cap—which is a closed bag—is in much the same position as the heart in the pericardium; it is inside the night-cap, but not in the cavity which intervenes between its two layers.

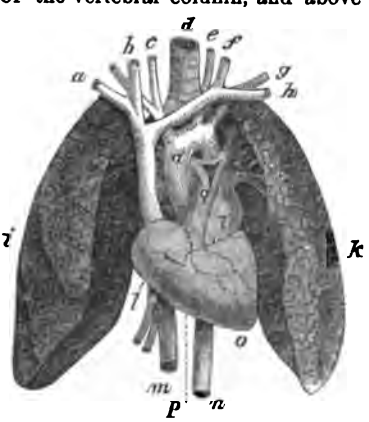


FIG. 2.—THE LUNGS, HEART, AND PRINCIPAL BLOOD-VESSELS IN MAN.

a, *h*, veins from the right and left arms; *b*, *f*, right and left jugular veins, returning the blood from the head and neck—these four veins unite to form a single trunk, the *vena cava superior*, which enters the right auricle, *l*; *c*, *e*, the right and left carotid arteries, the latter rising directly from the arch of the aorta, *a'*, the former from a short trunk called the *arteria innominata*; *g*, the left subclavian artery, rising directly from the aorta, while the right subclavian springs from the *arteria innominata*; *d*, the trachea or windpipe; *i*, *k*, the right and left lungs; *l*, *l'*, the right and left auricles; *p*, the right ventricle; *o*, the apex of ventricle; *m*, the inferior or ascending *vena cava*; *n*, the descending aorta, emerging from behind the heart; *q*, the pulmonary artery.

The substance of the heart is essentially muscular. The fibers run in different directions, longitudinally and transversely, but most of them obliquely; many pass over the apex from one side of the heart to the other; and all are so involved as to render it very difficult to unravel them. In consequence of this arrangement, the fibers, by their contraction, seem simultaneously to diminish each cavity in all directions, and thus serve most efficiently to drive the blood onwards. The size of the heart has been estimated as about that of the closed fist of the same individual. Its weight, as compared with that of the body, was determined by Dr. Clendinning to be 1:160 in the male, and 1:150 in the female. The same physician carefully examined nearly four hundred hearts of persons

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of both sexes, and determined the average weight at about 9 oz. avoirdupois, while Dr. John Reid found the average weight of the male heart to be a little more than 11 ozs., and that of the female heart to be a little above 9 ozs.

In our ideal sketch of the organs of C. (fig. 1), we have indicated the different cavities into which the heart is divided. In fig. 3 there is represented a section of the human heart, which is sufficiently like the reality to give the reader a fair idea of the position of its various parts. The two theoretical hearts, which were nearly in contact in fig. 1, are here fused into a single organ, but the division of the two sides is still as complete, in so far as the functions of the heart are concerned, as in the ideal scheme. We see a strong vertical partition separating the entire heart into two halves, which are very similar to each other. In the accompanying figure (fig. 4), we have a representation of all these valves—the auricles having been removed so as to give a distinct view of the upper surface of the ventricles. The tricuspid and mitral valves, which are entirely closed—the two ventricles contracting simultaneously—are represented by 1 and 3 respectively; while the pulmonary and aortic semilunar volves, which, when closed, always present a concave surface towards the lungs, are indicated by 4 and 5. The walls of the ventricles are much thicker than those of the auricles, and those of the left ventricle are about four times as thick as those of the right; the amount of muscular tissue being, in all these cases, proportional to the work to be done. All details regarding the anatomy of the heart, except such as bear directly upon the C., would be out of place in this article, and we shall, therefore, omit all notice of many structures which present themselves on opening its various cavities. We will merely add, that

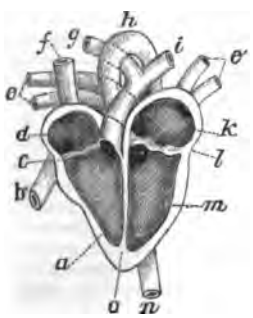


FIG. 3.—THEORETICAL SECTION OF THE HUMAN HEART:

f, *b*, the two *venæ cavæ*, opening into *d*, the right auricle; *c*, the tricuspid valve; *a*, the right ventricle, from which proceeds the pulmonary artery, dividing into branches *g* and *i*, going to the right and left lung respectively; *e*, *e'*, the pulmonary veins (two from either lung), entering into the left auricle, *k*; *l*, the mitral valve; *m*, the left ventricle, from which proceeds the aorta, whose arch is indicated by *h*, and the descending portion by *n*, none of its branches being indicated in this figure; *o*, the partition, or *septum*, between the right and left hearts.

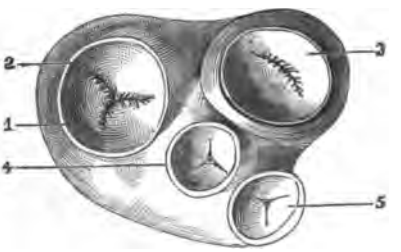


FIG. 4.—VALVES OF THE HEART AND ARTERIES.

Upper surface of the heart, the auricles having been removed. In this figure the heart is turned in such a position that the anterior surface lies lowermost; hence the apparent discrepancy of the *right* auriculo-ventricular orifice lying on the *left* side of the diagram.

1, Right auriculo-ventricular orifice, obliterated by the tricuspid valve; 2, fibrous ring surrounding this orifice; 3, left auriculo-ventricular orifice, surrounded by a ring, and closed by the mitral valve; 4, orifice leading into the aorta from the left ventricle, closed by the semilunar valves; 5, orifice leading into the pulmonary artery from the right ventricle, also provided with three semilunar valves.

the heart receives the arterial blood necessary for its own nutrition from the coronary arteries, two trunks which are given off by the aorta immediately above the semilunar valves; and that this blood having discharged its function, is carried back to the right auricle by the coronary veins; this blood obviously having the shortest possible systemic circulation.

Since all the arterial blood leaves the heart through the aortic opening, in tracing its course to the different parts of the system, we obviously have only to follow the aorta to its final branches. Referring to the article AORTA, where the principal branches of that great organ are indicated, it is sufficient, without further anatomical details, to say that the final ramifications of the arteries distribute the arterial blood to the capillaries (q.v.), which pervade every part of the body.

The *veins*, like the arteries, are found in nearly every tissue; they commence by minute plexuses (an anatomical term for a network-like arrangement), which communicate with the capillaries. Branches from these plexuses uniting together, form small venous trunks, which, by joining, increase in size as they pass onward towards the heart. If we except certain venous structures (called *sinuses*) occurring in the interior of the skull, we may divide the veins into two sets—the *superficial* or *cutaneous*, and the *deep* veins.

The deep veins accompany the arteries, and are usually inclosed in the same sheath of cellular tissue with them. In the case of the smaller arteries, they generally exist in pairs, one on each side the artery, and are called *venæ comites*, while the larger arteries have usually only one accompanying vein.

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The superficial veins occur immediately beneath the integument; they not only return the blood from the skin and adjacent structures, but communicate with the deep veins.

All the veins finally unite into two large trunks, termed the *superior* and *inferior vena cava*, which open into the right auricle of the heart; the superior vena cava being formed by the union of the veins which return the blood from the head and neck (the jugulars) with those which convey it from the arms (the subclavians), as shown in fig. 2; while the inferior vena cava (also shown in the same figure) receives the blood from the lower extremities, the trunk, and the abdominal and pelvic viscera.

We must refer to the article VEIN for the structure of the walls of this part of the circulating system. There is only one point that imperatively requires notice here—viz., that while the arterial system presents no valves, except at the points where the two great trunks leave the heart, the veins contain a great number of valves, which are formed by a doubling of their lining membrane, and resemble pocket-like folds or pouches, which allow the blood free passage towards the heart, but prevent its reflux.

There is one part of the venous C. which, from its great importance, requires special notice—viz., that of the venous blood of the spleen, prancreas, stomach, and intestinal canal. The blood supplied to these organs by the cœliac axis and the two mesenteric arteries is not returned directly to the vena cava, and thence to the heart, as occurs in other parts of the system. The veins of these organs unite together into one large vessel, called the *vena portæ*, which, entering the liver, branches out again like an artery, and finally subdivides into a capillary network that permeates the whole of its mass. It is from the venous blood, as it traverses these capillaries, that the bile is secreted. This portal blood, together with the blood of the hepatic artery, after it has become venous, is finally carried off by the hepatic veins (usually three in number), which open into the inferior vena cava.* Thus the blood which flows through the portal vein passes through two sets of capillaries, between the period of its leaving the aorta and entering the vena cava.

Our knowledge of the true course of the C.—viz., that the blood propelled from the left side of the heart, after traversing the arteries, returned by the veins to the right side of the heart; and the blood of the right side, passing through the pulmonary artery, traversed the lungs, and returned by the pulmonary veins to the left auricle—is of comparatively recent date. Harvey's celebrated work, *Exercitatio de Motu Cordis et Sanguinis*, was not published till 1628, although there is good reason to believe that it was written nine or ten years previously. Before the appearance of this celebrated work, which marks an epoch in physiological science, the views that were held on this subject were so vague that it is unnecessary for us to enter into any notice of them. (The reader who takes an interest in this point is referred to Dr. Willis's *Life of Harvey*, prefixed to his translation of Harvey's works, for the Sydenham society.) In one point, Harvey's proof of the course taken by the blood was defective; the microscope had not then revealed the existence of the capillaries, and he was consequently altogether at fault as to the mode by which the blood passed from the arteries to the veins. By a strange coincidence, Malpighi, who discovered the corpuscles by which the motion of the blood in the capillaries can be traced, was born in the course of the very year (1628) in which Harvey's work was published.

The double C. which we have described, is the course performed by the blood from the time of birth during the whole period of life. The C. of the blood, however, begins before birth—indeed, at a very early period of intra-uterine or fetal existence; and the circumstance that before birth the lungs do not act as organs of respiration, induces a very important modification in the course of the blood in fetal life, which will be described under FŒTUS.

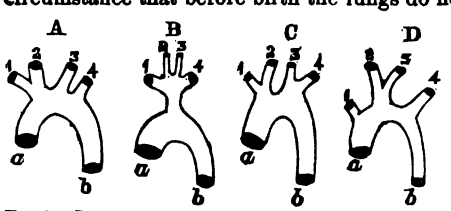


FIG. 5.—DIAGRAM OF CERTAIN VARIETIES IN THE ORIGIN OF THE MAIN TRUNKS FROM THE ARCH OF THE AORTA:

A, Man; B, the Ruminants; C, Dolphin and Bats; D, the Elephant. 1, the right subclavian; 2, right carotid; 3, left carotid; 4, left subclavian; *a*, ascending aorta; *b*, descending aorta.

We now leave for the present the C. in man, and proceed to notice some of the leading peculiarities of the C. in other animals. In the warm-blooded animals—mammals and birds—the course of the blood is *essentially* the same as in man, for in all these animals the heart, like the adult human heart, possesses four distinct cavities. In form, however, it presents certain peculiarities in some of the mammalia. It is generally more rounded and less elongated than in man. In the cetacea, it is very broad and flat; and in at least one genus, the dugong, the right and left ventricles are separated by a deep fissure. In some herbivorous mammals, as in the ox, sheep, goat, etc., a cruciform ossification, called the bone of the heart, is found in the septum between the ventri-

* In fishes, not only the blood of the intestines, but that of the posterior part of the body, enters this portal system, which is distributed in this class of animals both to the kidneys and to the liver.

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cles. In the ornithorhynchus, or duck-billed platypus, the heart, in some respects, resembles that of birds. We likewise find certain varieties in the distribution of the blood-vessels. Thus, while in man the subclavian and carotid arteries arise on the right side from a short common trunk given off by the aorta, and on the left side arise directly from the aorta, we find several varieties of this arrangement in the mammalia. In the horse and the ruminants, the aorta divides at once at its origin into an anterior trunk, which gives off the carotid and subclavian arteries of both sides, and a posterior trunk for the thoracic and abdominal aorta. In the dolphin, and in some—if not all—of the bats, two short trunks (*arteriæ innominatæ*) arise, and give off each a carotid and subclavian on either side. In the elephant, both carotids are given off from a single common trunk, situated midway between the two subclavians. All these, and other varieties which might be noticed, are occasionally found in man; and it may be laid down as a general rule, that when any abnormal arterial distribution is detected in the human subject, it represents the normal type in some lower mammal.

A very remarkable peculiarity in the distribution of the vascular system (both arteries and veins) is exhibited by the cetacea and other diving animals, in which the respiration, and consequently the arterialization of the blood, is temporarily stopped. Various arteries of the trunk here assume a ramified and convoluted form, so as to constitute reservoirs capable of holding a large quantity of pure blood; while the venous trunks exhibit similar dilatations, capable of receiving and retaining for a considerable time the impure blood which has circulated through the system, and of thus preventing the right heart from being overcharged with venous blood during the temporary suspension of respiration. By means of these arterial reservoirs, the cetacea can support life under water for a quarter of an hour, or even longer.

Another peculiarity deserving of notice is, that occasionally a large artery will divide into a great number of smaller vessels, which again reunite to form a single trunk. An arrangement of this kind is known as a *rete mirabile*, and a good example of it occurs within the skull in long-necked grazing animals, the object being to check too strong a current of blood to the brain.

In birds, the heart is usually of a very large size, as compared with the bulk of the body. The trunk of the aorta is extremely short, and divides into three main branches, the central one forming the descending aorta, while the two lateral ones give off the carotid and subclavian arteries on either side. The branches of the latter give an abundant supply of blood to the powerful thoracic muscles by which the wings are moved.

In the class of reptiles, there is not a complete double C., a mixture of arterial and venous blood being sent both to the lungs and to the general system. In fig. 6, the general nature of the C. in this class is typically represented. The heart consists of two auricles and one ventricle. The impure blood which has circulated through the system is conveyed by the vena cava into the right auricle, from whence it passes into the common ventricle. At the same time, blood which has been aërated in the lungs is poured into it from the left auricle; hence the ventricle contains an admixture of venous and arterial blood. As both a pulmonary artery and an aorta are given off by the ventricle, the latter by its contractions simultaneously drives one portion of its contents to the lungs, and another to the general system. In this way, a semi-oxygenated blood is transmitted to the various parts of the body, the only pure blood being that which is contained in the left auricle and in the veins opening into it.

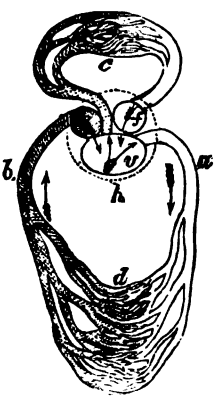


FIG. 6.—CIRCULATION IN REPTILES: *h*, heart, inclosed in pericardium; *f*, *f'*, right and left auricles; *v*, single ventricle; *a*, aorta; *b*, vena cava; *c* smaller circulation; *d*, greater circulation.

Although the above may be regarded as the *general* type of the circulating apparatus in reptiles, yet there are many modifications of it (into which we have not space to enter), which connect it on the one hand (in the case of the *perennibranchiate amphibia*, such as the axolotl, proteus, etc.) with that of fishes, and on the other hand (when there is a more or less perfect separation of the ventricular cavity, as in the crocodiles) with that of birds and mammals.

In the class of fishes, the circulating apparatus is far simpler than in reptiles. The heart possesses only two cavities, an auricle and a ventricle, and is traversed solely by venous blood; hence it is analogous to the right side of the mammalian heart. Venous blood is brought by veins, which correspond with our *venæ cavæ*, from all parts of the system, and enters the auricle (see fig. 7); from the auricle, the blood passes into the ventricle, which is of great muscular strength; and the ventricle propels its contents through a vessel which corresponds with our pulmonary artery, and which dividing on either side into four or five branches, goes to the gills, in the capillaries of which it becomes oxygenated, by means of the air that is diffused through the water. From the filaments and fringe-like structures of the gills, it is at length collected into a large trunk, commonly called the dorsal vessel, but analogous to the aorta of mammals and birds, in so much as it supplies the whole body with arterialized blood. After passing through the systematic capillaries, the blood returns in a venous condition to the heart,

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and the above process is repeated. Although the heart is simpler than in reptiles, the C. is in one sense of a higher character, in so far as pure arterial (not mixed) blood is here conveyed to all parts of the system; hence, probably, the far greater muscular energy of fishes may be explained.

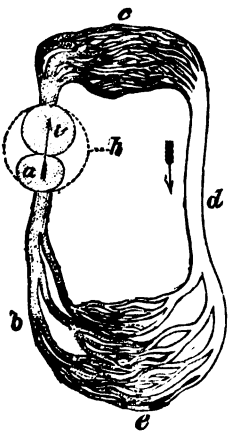


FIG. 7.—CIRCULATION IN FISHES:
h, heart, inclosed in pericardium; *a*, the auricle; *v*, the ventricle; *c*, the capillary circulation in the gills; *d*, the dorsal artery; *e*, the systemic capillaries; *b*, the veins.

We can only allude very briefly to the C. in the invertebrate animals.

In the mollusca, we find hearts of varying complexity,* usually with one or two auricles, and one ventricle; but in all cases, the auricle or auricles receive aërated blood from the respiratory organs and pass it to the strongly muscular ventricle, which propels it over the body. The heart is therefore a *systemic* heart. There seem to be no capillaries in these animals: excepting in the respiratory organs; the blood leaving the open ends of the arteries, passes into the interstices (*lacunæ*) of the parenchyma of the body, from whence it is taken up by the open mouths of the venous radicles; hence this kind of C. is called lacunary.

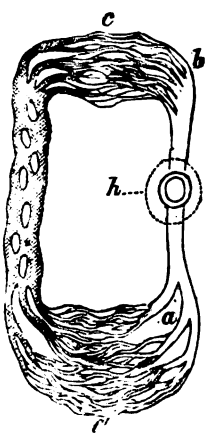


FIG. 8.—CIRCULATION IN THE CRUSTACEANS:
h, the heart and pericardium; *a*, the arteries; *c'*, the systemic capillaries; *c*, the branchial or respiratory capillaries; *b*, the branchio-cardiac vessels.

In the crustacea, the form of the heart and the number of its orifices presents several modifications; the following is, however, the *typical* mode of C. of these animals. The heart, which is here a single cavity, is sometimes round, and sometimes long and tubular, and is the point of departure of the arterial system, which consists of trunks emerging in various directions. The blood returning from the arteries does not enter into distinct veins, but into irregular excavations in the tissues, which are termed venous sinuses; from these venous sinuses it passes to the gills, from whence it is returned to the heart in an aërated state by the branchio-cardiac canals; so that here, as in the mollusca, the heart is systemic.

It is unnecessary for us to notice the comparatively imperfect C. in insects and animals lower in the scale than those we have already considered.

We now approach the last part of the subject—the physiology of the circulation.

We shall consider—1. The flow of blood through the heart; 2. The phenomena of the arterial C.; 3. The phenomena of the capillary C.; and, 4. The phenomena of the venous circulation.

1. Direct observation and experiment clearly show, that the muscular contraction of the heart is the principal source of the power by which the blood is propelled in its course. This action of the heart may be observed by opening the chest of a living animal, or, better still, of an animal deprived of sensation and motion by poison, and in which artificial respiration is kept up. It is then seen to consist of two motions—first, a contraction or systole of the auricles, and second, a corresponding contraction of the ventricles. The contraction of the auricle immediately precedes that of the ventricle, and the systole of each cavity is directly followed by its diastole or relaxation; there is then a brief period of repose, the heart exhibiting little or no motion. At the moment of the systole of the ventricles, the apex of the heart is tilted forwards, causing a pulsation against the ribs that can be felt externally.

The force exerted by the left ventricle has been so very variously estimated, that we must regard this point as still unsettled. The number of contractions of the heart of an adult in a minute is about 70 or 75; it is, however, liable to great variations, which will be noticed in the article PULSE. The sounds accompanying the heart's action, which may be readily heard by applying the ear either directly or through the medium of the stethoscope to the cardiac region, are discussed in the article HEART, SOUNDS OF THE.

2. The arteries exercise a vast influence on the movement of the blood through them, in virtue of two properties which they possess—viz., elasticity and contractility. These two endowments are not equally and uniformly possessed by the whole arterial system—elasticity (the property by which the interrupted or discontinuous force of the heart is made equable and continuous) existing chiefly in the larger trunks; while contractility—which is more required for regulating the flow of blood to particular parts—is most

* In some of the ascidians and in salpa, the following remarkable phenomenon occurs: The heart, which is extremely simple, and of course without valves, at definite intervals (of about twenty minutes) reverses the direction of its current. Before the heart changes the direction of its contractions, it remains still for a short time, and the blood-currents in the body are thus slackened in their course before they receive an impulse in the opposite direction. The vessels entering and leaving the heart thus act alternately as an aorta and as a vena cava.

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marked in the smaller vessels. The rate of movement of the blood through the arteries in man can only be roughly calculated from experiments on animals. Volkmann finds that in the carotids of mammals, the average velocity of the blood-stream is about 12 in. per second; he has likewise ascertained that the velocity is greater in arteries lying near than in those at a distance from the heart, that it is not increased by an augmentation in the number of pulsations, but that it is greatly augmented by an increase in the volume of the blood, and lessened by its diminution.

3. It has long been a debated point, whether the capillary C. is influenced by any other agency than the contractility of the heart and arteries. Harvey believed that the action of the heart alone was sufficient to send the blood through the whole circuit, and in recent times his view has been supported by J. Müller and other eminent physiologists. On the other hand, Prof. Draper of New York holds the opposite extreme view, asserting that "it is now on all hands conceded that the heart discharges a very subsidiary duty." We believe that Bichat was the first to maintain the opinion, that the capillaries are organs of propulsion, and are alone concerned in returning the blood to the heart through the veins. Although Bichat attributed too great power to the capillaries, there cannot be a doubt that the movement of the blood through these vessels is not solely due to the heart; in short, that there is what may be termed a capillary power. The following are a few of the facts proving this to be the case: 1. On watching the C. in the web of a frog's foot, it is at first seen to go on with perfect regularity. After a time, however, various changes are observed, which cannot be attributed to the heart, such as alterations in the size of some capillaries, and in the velocities of the currents passing through them, and occasionally even a reversal in the direction of some of the lesser currents. 2. In cold-blooded animals, the movement of the blood in the capillaries continues long after the excision of the heart. 3. Actual processes of secretion not unfrequently continue after death; sweat, for instance, may be exuded from the skin; and other secretions may be formed by their respective glands, which could not take place if the capillary C. had stopped. 4. Cases occasionally occur in which a fetus without a heart is produced, and yet in these cases most of the organs are well developed.

What the nature of this capillary power is, is not clearly known. Prof. Draper and others have endeavored to explain it on the principles of capillary attraction. There is no satisfactory evidence that the capillaries possess true contractility, for, although their diameter is subject to great variations, this may be due simply to the elasticity of their walls. If we could only establish their contractility, the difficulty would be removed.

The rate of movement of the blood through the capillaries is about 1.2 in. per minute in the systemic capillaries of the frog. In the warm-blooded animals it is probably more rapid. From Volkmann's observations, the rate in the dog is about 1.8 in. per minute.

4. It is usually estimated that the venous system contains from two to three times as much blood as the arterial. The latter is probably the more correct ratio, and as the rapidity of blood in the two systems seems to bear an inverse ratio to their respective capacities, the venous blood will move with only one third of the velocity of arterial blood. We have already noticed the occurrence of valves in the venous circulation. Their object is evidently to prevent the reflux of blood; hence they are of important use in the maintenance of this part of the circulation. They are most abundant where there is much muscular movement. The movement of blood through the veins is undoubtedly mainly due to the *vis a tergo* resulting from the contraction of the heart and arteries. This is much assisted in many parts of the system by the constantly recurring pressure of the adjacent muscles upon their trunks. The movement of inspiration, by causing a comparative vacuum in the chest, has been supposed by some physiologists to assist the flow of venous blood to the heart, and a similar influence has been ascribed to an assumed suction-power of the heart. The contractility of the veins in man is too slight to produce any marked effect on the propulsion of the current. From the investigations of Prof. Wharton Jones "on the rhythmical contractility of the veins of the bat's wing," we may infer that, in many of the lower animals, it is probably a more efficient power. In connection with this article, consult Artery, Capillaries, Pulse, and Vein.

Circulation of Sap in plants—its ascent from the root to the leaves and bark, and its partial descent after the elaboration which it undergoes in these organs. The sap drawn from the ground by the roots (see Osmose) ascends in exogenous plants, which have hitherto been principally the subjects of examination, through the more recent parts of the woody tissue, and especially through the alburnum. The descent of the sap takes place chiefly through the liber or inner bark. It appears certain also that, on its return to the root, only a small portion is excreted, and that the greater part ascends again, readapted to the use of the plant by the excretion which has taken place. Much of the sap which is taken up by the roots is, however, thrown off in perspiration by the bark and leaves. The sap is also latterly diffused through the cellular tissue of plants, and very interesting observations have been made by Schultz and others on peculiar movements of the elaborated or descending sap (*latex*). Many physiologists

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dislike the term *circulation* applied to sap, as suggesting a closer analogy than really exists to the circulation of the blood in animals. See PLANT, LEAVES, and SAP.

CIRCUMCELLIO'NES, fanatical Donatists of the 4th c., who got their name from their habits of wandering. They rambled over the country, plundering, burning houses, and murdering those who made resistance, saying that by such means they sought the crown of martyrdom. They styled themselves "Milites Christi Agnostici," and called their chiefs the leaders of the sons of the Holy One. Constantine treated them with forbearance, but under his successor they were put under restriction by the civil power.

CIRCUMCISION (Lat. a cutting around), the cutting off the foreskin (*præputium*), a rite widely diffused among ancient and modern nations. The prevalent idea among Christians was (and perhaps still is), that the rite originated with Abraham, who (as we read in Gen. xvii. 9–14) was commanded by God to circumcise himself and his whole household, and to transmit the custom to his descendants. But, as Jahn (*Biblische Archäologie*, Vienna, 1797–1800) acutely observes, this is inconsistent with the very terms in which the command is expressed, these terms presupposing a knowledge of the rite on the part of Abraham. That it existed previously to the time of the patriarch, however, seems to be indisputable. The researches of modern scholars prove that the Egyptians, for instance, were in the habit of circumcising long before Abraham was born. Rawlinson, in a note to his version of Herodotus, remarks that "circumcision was already common in Egypt at least as early as the fourth dynasty of kings, and probably earlier, long before the birth of Abraham, or 1996 B.C." The testimony borne by the monuments of Upper and Lower Egypt (consult sir Gardiner Wilkinson's *Manners and Customs of the Ancient Egyptians*) is to the same effect, and apparently conclusive. Another argument which has been adduced against its Abrahamic origin, is the fact of its being so extensively practiced. At the present day, it may be traced almost in an unbroken line from China to the cape of Good Hope. It is also a usage in many of the South Sea islands, and the followers of Columbus were much astonished to find it existing in the West Indies, and in Mexico. Recently, too, it has been ascertained to have been long practiced by several tribes in South America. Such being the case, many scholars hold it impossible to suppose that the origin of so universal a rite can be traced to a single Semitic nation, more especially when that nation was peculiarly averse to intercourse with other nations, and in other respects exercised no overt influence on their customs. Whether, as Jahn supposes, Abraham obtained his knowledge of C. from the Egyptians, we cannot determine. It would appear, however, that the Canaanites, among whom he came to reside, were not circumcised, for we read of the prince of Shechem and his people undergoing the operation, that the former might obtain the hand of Dinah, daughter of Jacob; and the institution of it in the family of Abraham was probably sufficient to mark off that family from the surrounding tribes. In the case of Abraham and his descendants, the rite acquired a religious significance. It was ordained to be the seal of the everlasting covenant between God and Israel.

The time for C. among the Jews is the 8th day after the birth of the child; among the Arabians, the 13th year, in remembrance, it is said, of their ancestor Ishmael; among the Kaffirs, at a still later period, marking, in fact, the transition from youth to manhood; and, indeed, each nation seems to have selected the time most agreeable to its own notions of what is prudent or becoming. The Abyssinians are the only people professing Christianity among whom C. is practiced. The C. of females, or what is equivalent to such, is not unknown among various African nations. For fuller information in regard to C., consult Sonnini's *Travels in Egypt*, sir John Marsham's *Chronicus Canon Ægyptiacus*, and Winer's *Biblisches Realwörterbuch*.

CIRCUM'FERENCE, or PERIPH'ERY, the curve which incloses a plane figure: thus, we speak of the circumference of a circle, or of an ellipse; but in figures bounded by straight lines, as the triangle, square, and polygon, the term *perimeter* is employed to designate the whole bounding lines taken together.

CIRCUMLOCUTION OFFICE is the name applied by Dickens in his novel, *Little Dorrit*, to the delays in transacting public business. He describes it as the "chief of public departments in the art of perceiving *how not to do it*."

CIRCUMNAVIGATION, the term usually applied to the act of sailing round the world, its literal meaning being simply a sailing round. The C. of the globe was at one time considered a great feat, but it is now regarded as one of the most commonplace affairs in a sailor's experience. The first to circumnavigate the globe was Magalhaens (q.v.), or Magellan, a Portuguese, in 1519; eighteen years afterwards it was accomplished by a Spaniard; and in 1577 by the illustrious Englishman, Drake. The most celebrated of circumnavigators, however, was capt. James Cook, who, between 1768 and 1779, made three voyages round the world.

CIRCUMNUTATION is the name of a law formulated by Darwin, resulting from observations of Gray, Palm, Dutrochet, von Mohl, and others, with his own. The waxing parts of plants are governed by a law causing them to rotate as they grow, and identical with the spiral movement of climbing plants. Experiments show that the movements of the growing parts of all plants are governed by C., while other movements are referred to natural selection. The discovery of C. has scientific significance.

CIRCUMPO'LAR STARS, those stars which, in the apparent daily revolution of

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the sky, do not pass below the horizon of the observer, or, in familiar language, do not set. It will be remembered that the apparent daily motion of the stars is the reflex of the actual rotation of the earth upon an axis which passes through the center of the earth and a point in the sky, near the north, or polar star; that the lines in which the stars seem to move, called lines of daily motion, are the circumferences of circles that are perpendicular to this axis. Hence, if an observer is at the equator, the axis lies in the observer's horizon, the circles of daily motion are all perpendicular to the horizon, and all stars seem to rise and set. If the observer is at a distance from the equator, for example 10° n., the northern end of the celestial axis is raised 10° above the horizon, and any star which is within 10° of the n. pole of the sky will not pass below the horizon in its apparent motion about the pole. The largest circle of the sky which may be drawn about the pole without passing below the horizon, is called the circle of perpetual apparition. A similar circle drawn about the s. pole, without coming above the horizon, is called the circle of perpetual occultation, and the stars within that circle are never visible to the observer in consideration. But, to an observer in the southern hemisphere, having a s. latitude equal to the n. latitude of the first supposed observer, the terms will be transposed; the circle about the s. pole is to him a circle of perpetual apparition, and the stars within it, circumpolar stars. See ASTRONOMY.

CIRCUMSTANTIAL EVIDENCE. See EVIDENCE.

CIRCUMVALLATION, in fortification, is a series of works surrounding a place when under siege; not to serve offensively against the place, but to defend the siege-army from an attack from without. It usually consists of a chain of redoubts, either isolated or connected by a line of parapet. Such lines were much used in the sieges of the ancient and middle ages; but in modern times they are not so necessary, because the use of artillery lessens the duration of a siege, and also because the besiegers have generally a corps of observation in the open field, ready to repel any force of the enemy about to succor the besieged. A remarkable example of C. was that at Sebastopol, where, while a circuit of batteries fired upon the town, an outer circuit of redoubts and lines kept off the Russians who were in the open field; but the necessity for this arose out of the smallness of the besieging force compared with that of the besieged. The narrow escape of the allies from utter overthrow at Inkermann, showed the necessity for this external defense. For the relation which C. bears to CONTERVALLATION, see that article.

CIRCUMVEN'TION. See FRAUD.

CIRCUS. See HARRIER.

CIRCUS, THE, of ancient Rome, was a large oblong building adapted for chariot-races and horse-races, and used also for the exhibition of athletic exercises, mock-contests, and conflicts of wild beasts. The circensian games were alleged by tradition to have originated in the time of Romulus, when they were dedicated to Consus or Neptune, and called *Consualia*. After the first war undertaken by Tarquinius Priscus, in which he captured the Latin city of Apiolæ, his victory was celebrated by games. A space was marked out for a C., and the senators and knights were allowed to erect scaffoldings round it for themselves. The games continued to be held annually, and a permanent edifice was soon afterwards constructed. This was distinguished, subsequent to the erection of the Flaminian and other large circi, as the circus maximus. It must have been altered and enlarged at various times. According to different computations, it was capable of holding 150,000, 260,000, or 385,000 persons. Its extent also has been variously estimated. In the time of Julius Cæsar, it was three stadia, or 1875 ft. long, and one stadium, or 625 ft. wide, while the depth of the buildings surrounding the open space was half a stadium, or about 312 feet. All the circi in Rome, of which there were a considerable number, are now completely destroyed; but a small C. on the Appian way, about 2 m. from Rome, known as the circus of Caracalla, is still in a state of preservation. Its construction is believed to have differed very little from that of similar buildings.

Along the sides and at the curved end were ascending ranges of stone seats for the spectators. At the other end, were the *carceres*, or stalls, which were covered, and furnished with gates, and in which the horses and chariots remained until, on a given signal, the gates were simultaneously flung open. In the center is the *spina*, a long and broad wall round which the charioteers drove, terminating at both ends at the *metæ*, or goals—three cones of carved wood which marked the turnings of the course. At each extremity of the *carceres* is a stone tower. From its gates and castellated appearance, the whole of this side received the name of *oppidum*, a town. Over the *carceres* were seats for the president of the games, the consuls, or other distinguished persons. There were four entrances, of which the most important were the *porta pompæ*, and the *porta triumphalis*. The games were inaugurated by a procession from the capitol, in which those bearing the images of the gods went first, and were followed by the performers in the games, the consuls, and others. This procession entered through the *porta pompæ*, while the *porta triumphalis* was that by which the victors left the circus.

The *spina*, an object conspicuous from its situation, was in general highly decorated by such objects as statues, small temples, altars, etc. In the *spina* of the Circus Maximus, two very large obelisks were erected by Augustus and Constantius. This C. was

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also distinguished by six towers, and by a canal or *euripus*, formed by Julius Cæsar, to protect the spectators more effectually during the conflicts of wild beasts.

The C. was especially adapted for races, an amusement of which the Romans were passionately fond. The length of a race was seven circuits round the *spina*, and 25 races were run in each day. The number of chariots was usually four. The charioteers adopted different colors, representing the four seasons. Bets and party-spirit ran high, and the victor received a substantial pecuniary reward at the end of the race. The athletic exercises, such as boxing and wrestling, which sometimes terminated fatally, were probably exhibited in the large open space between the *carceres* and the *spina*. The *ludus Trojæ* was a mock-conflict between young men on horseback. A regular battle was sometimes represented (*pugna equestris et pedestris*). By the formation of canals and the introduction of vessels, a *naumachia*, or sea-fight, was occasionally exhibited; but, under the empire, this species of exhibition, as well as the *venatio*, was gradually transferred to the amphitheater (q.v.). In providing for the *venatio*, or hunting of wild beasts, vast sums of money were expended. Animals were procured from every available part of the Roman empire, including Africa and Asia. The exhibition not only afforded an opportunity for the display of private munificence or ostentation, but attained the importance of a political engine, which none who aspired to popularity ventured to overlook. When Pompey opened his new theater, he is said to have given public exhibitions in the C. for five days, during which 500 lions and 20 elephants were destroyed.

In modern times, the C. stands but as the shadow of a name. It is about the same size as the modern theater, and is employed principally for the exhibition of feats of horsemanship and for acrobatic displays.

CI'RENCES'TER, or CICESTER, a parliamentary borough in Gloucestershire, in England, on an upper branch of the Thames, and on the Thames and Severn canal, 17 m. s.e. of Gloucester. It has four chief streets, and the appearance of opulence, though it has but little trade. A complete agricultural college was founded here in 1846 on a farm of 600 acres. Pop. '91, 7441. C. returns one member of parliament. C. was the Roman *Corinium-Ceaster*, at the junction of five Roman roads, and has traces of ancient walls 2 m. in circuit. Roman relics have been found here, as coins, urns, baths. Canute held a council here in 1020 to expel Ethelwolf. Rupert stormed C. in 1642 and 1643, and it was afterwards given up to Essex.

CIRIL'LO, DOMENICO, 1734–99; a Neapolitan naturalist who accompanied lady Walpole to France and England, and became a fellow of the royal society, enjoying there and on the continent the friendship of Buffon, Diderot, D'Alembert, and other learned men. When the French established government in Naples in 1799, C. was chosen a representative, and became president of the legislative commission. After the re-establishment of the royal government, he was sentenced to death, but was offered his life if he would ask for mercy. This he refused to do, and suffered death. He wrote works on botany and entomology.

CIRRHOP'ODA, or CIRRIP'EDA (Gr. or Lat. cirrhus-footed), the animals which formed the genus *lepas* of Linnæus, ranked by him among the multivalve *testacea*, and by subsequent naturalists very generally regarded as an order of mollusks, until, in consequence of recent discoveries, a place has been assigned them among the *articulata*, either as a distinct class of that great division of the animal kingdom, or as a sub-class of *crustacea*. Barnacles (q.v.) and *balani* or acorn-shells (see BALANUS) are the most familiar examples of C.; but many species are now known, all exhibiting much general similarity to these, all marine, and all in their mature state permanently attached to objects of various kinds, as rocks, sea-weeds, shells, etc. Some are found imbedded in corals, others in the thick skin of whales, some in the flesh of sharks. They are distributed over the whole world; the species, however, are not numerous anywhere; those species which adhere to fixed bodies are in general much more limited in their geographic range than those which attach themselves to floating objects or to vertebrate animals. They are generally divided into two orders, *pedunculated* and *sessile*, those of the former order being supported on a flexible stalk, which is wanting in the latter. Barnacles are pedunculated C., and *balani* are sessile.

The resemblance of C. to mollusks consists chiefly in their external appearance. In the more important parts of their organization, however, the C. resemble crustaceans rather than mollusks. The gills, when these exist, occupy the same relative position as in crustaceans; but the aëration of the blood is supposed to be also effected in the *cirrhi*, as the limbs or organs have been generally called, of which there are six pair on each side, and which may be described as long tapering arms, each composed of many joints and *ciliated* or fringed with stiff hairs. The *cirrhi* nearest the mouth are shortest, and all of them together form a sort of net for the capture of minute animals, being incessantly thrown out by the cirrhopod from a lateral opening of its sac, and drawn in again in such a manner as to convey any prey which they may have caught to the mouth. Almost all the C. are hermaphrodite; but in a few genera the sexes are distinct, and these exhibit an anomaly of a very remarkable kind, the males being not only very small in comparison with the females, and more short-lived, but, in their mature state, *parasitic* on the females, or attached to them as they are to other objects; whilst in some the still more remarkable anomaly appears of what have been called *complemental* males, attached

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in this way to hermaphrodites. The eggs of C. are hatched before being finally set free from the body of the parent. The young possess the power of locomotion, swimming freely in the water, and are furnished with eyes, which disappear after they have permanently fixed themselves, by instinctive choice, in situations adapted to their kind. They have also shells, quite different from those of their mature state. The shelly coverings of the C. are all formed according to a certain type, but with many variations, and they differ extremely in the number of pieces or valves of which they consist, some, as the common barnacles, having only five valves, and others having additional small pieces arranged in whorls, and exceeding 100 in number.

The most important discoveries concerning the structure and metamorphoses of the C., determining their place in the animal kingdom, were made by Mr. J. V. Thompson. For the most extended examination of species, and for an admirable monograph, published by the Ray society, the scientific world is indebted to Mr. Darwin.

CIRRHOSIS. See ALCOHOLISM.

CIR'RHUS, CIR'RUS (Lat. a curl, or lock of hair), or TENDRIL, in botany, a leaf altered into a slender spiral, which, by twisting around such objects as it comes in contact with, attaches the plant to them, and enables it to climb, when otherwise, through the weakness of its stem, it must have been prostrate. There are many varieties of C., as it is merely an elongation of the midrib of a pinnate leaf—an altered terminal leaflet, or becomes compound by the alteration of several leaflets, or occupies altogether the place of a simple or compound leaf, and is accordingly either simple or branching. Examples of different kinds may be seen in the pea, vetch, vine, passion-flower, etc.—The term C. is also employed in zoology, to designate any curled filament, and has been applied, but not quite aptly, to the curiously modified feet of the *cirrhopoda*.

CIR'RUS. See CLOUDS.

CIRTA, an ancient city of Numidia, Africa, in the country of the Massyli, regarded as the strongest position in Numidia. It was the center of all the Roman military roads. It was restored by Constantine, and the modern town now bears his name.

CIS, a Latin preposition meaning, "on this side," which is often prefixed to names of rivers and mountains to form adjectives; Cisalpine, Cispadane, "on this side of the Alps," "of the Po." As most of these words are of Roman origin, Rome is considered the point of departure.

CISAL'PINE REPUBLIC. After the battle of Lodi, in May, 1796, Gen. Bonaparte proceeded to organize two states—one on the s. of the Po, the Cispadane republic, and one on the n., the Transpadane. These two, however, were in 1797 united into one under the title of the C. R., which embraced Lombardy, Mantua, Bergamo, Brescia, Cremona, Verona, and Rovigo, the duchy of Modena, the principality of Massa and Carrara, and the three legations of Bologna, Ferrara, and the Romagna. The republic had a territory of more than 16,000 sq.m., and a population of 3½ millions. Milan was the seat of the government or directory, and the place of meeting of the legislative assembly, which was composed of a senate of 80 members, and a great council of 160. The army consisted of 20,000 French troops, paid by the republic. A more intimate connection was formed in 1798 between the new republic and France, by an alliance offensive and defensive, and a treaty of commerce. The republic was dissolved for a time in 1799 by the victories of the Russians and Austrians, but was restored by Bonaparte, after the victory of Marengo, with some modifications of constitution and increase of territory. In 1802, it took the name of the Italian Republic, and chose Bonaparte for its president. A deputation from the republic in 1805 conferred on the emperor Napoleon the title of king of Italy; after which it formed the kingdom of Italy till 1814.

CISLEITHANIA, or CISLEITHAN AUSTRIA, a name applied to that portion of the Austro-Hungarian monarchy which is represented in the Reichsrath of Vienna. It has about one-half the area and four-sevenths of the population of the monarchy, and embraces the crown lands once belonging to the German confederation, Dalmatia, Buckowma, and Galicia.

CIS'PADANE REPUBLIC. See CISALPINE REPUBLIC.

CIS'PLATINE REPUBLIC, the name of the republic of Uruguay, 1829–31. It had previously belonged to Brazil and had the name of the Cisplatine province.

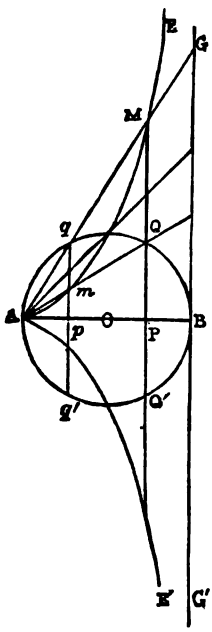
CIS'RHENANE REPUBLIC, the name chosen in 1797 for the proposed confederation of the German towns w. of the Rhine. As the whole region was soon afterwards transferred to France, the name never came into use.

CISSAM'PELOS (Gr. ivy-vine), a genus of plants of the natural order *menispermaceæ*, of which some of the species possess valuable medicinal properties; particularly *C. pareira*, a native of the West Indies and warm parts of America, the root of which was formerly thought to be that called *pareira brava*. The plant is called velvet leaf in the West Indies, from the peculiar and beautiful appearance of the leaves. It is a climbing shrub, with roundish-triangular leaves, racemes of small yellow flowers, and small hairy scarlet berries. The root appears in commerce in pieces of 2 or 3 ft. long, varying from the thickness of the finger to that of the arm, tough, but so porous that air can be blown from end to end of it. It has a sweetish, afterwards nauseous taste; is used as a tonic

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and diuretic, appears to exercise a specific influence over the mucous membrane of the urinary passages, and is administered with advantage in chronic inflammation of the bladder. It was formerly supposed to possess great lithontriptic powers, which it was even hoped would put an end to all necessity for lithotomy. It is supposed that the roots of other plants of the same order are often fraudulently mingled with it; but those of several species of C., both American and East Indian, appear to possess pretty nearly the same properties. An alkaloid, called *cissampelin*, exists in this root.

CIS'SOID OF DI'OCLES, a curve first employed by Diocles the mathematician, whose name it bears, for the purpose of solving two celebrated problems in geometry—viz., the trisection of a plane angle, and the construction of two geometrical means between two given straight lines. Let AB (see fig.) be the diameter of any given circle, and PQ, *pq*, any two ordinates at equal distances from the centre O. Then if we draw a straight line through A and either of the points *q*, Q, and produce it till it cuts the other ordinate, produced if necessary, the point of intersection, M, or *m*, will, in its different positions, trace out a curve called a *cissoid*. The circle AB is called the generating circle, and the diameter AB is called the axis of the curve. It is clear from the figure that the cissoid must consist of two infinite symmetrical branches, AE and AE', having a cusp point at A. The straight line GB, tangent at B to the generating circle, is a common asymptote to these branches. Taking A as origin, and AB = a and a line at right angle to it, through A, as axes of co-ordinates, the equation to the cissoid is $y^2 = \frac{x^3}{(a-x)}$. The curve may be constructed mechanically. The area of the space included between the two branches and their asymptote, is equal to three times the area of the generating circle. If, instead of a circle, we employed any other curve as the generating curve, the curve generated in the same way as the C. of D., is called *cissoidal*. The word cissoid comes from the Greek *cissos*, ivy, and *eidos*, form.



Cissoid.

CIS'SUS. See VITACEÆ.

CIST. See COFFIN; BARROW; BURIAL.

CISTER'CIANS, a religious order, taking its name from the parent monastery of Citeaux (Cistercium), near Dijon, which was founded in 1098 by the Benedictine abbot, Robert of Molême. Through the influence chiefly of St. Bernard of Clairvaux, who became a monk of Citeaux in 1113, the order, within little more than a century after its foundation, was in possession of more than 1800 abbeys in France, Germany, England, Ireland, Denmark, Norway, and Sweden. The C. were distinguished from the order of Clugny by their severer rule and stricter poverty, avoiding any splendor in their churches, even gold and silver crosses; by being submissive to the jurisdiction of the bishops, at least till after the death of St. Bernard; by not meddling with the cure of souls; by wearing a white robe with a black scapulary; and by their peculiar form of government, which was introduced by Innocent III., in 1215, into all the monastic orders. In France, the members of this order called themselves Bernardines, in honor of St. Bernard. Among the fraternities emanating from the C., the most remarkable were the Barefooted monks or Feuillans, and the nuns of Port Royal in France, the Recollets or or reformed Cistercian nuns in Spain, and the Trappists. The number of Cistercian abbeys in England, in the reign of Henry VIII., was 75, besides 26 Cistercian nunneries. In Scotland, there were 11 abbeys, and 7 nunneries. Among the English abbeys were Woburn, Tintern, Furness, Fountains, Kirkstall, and Rievaux; among the Scottish, Melrose, Dundrennan, Kinloss, Glenluce, Culross, Deer, Balmerino, and Sweetheart or New Abbey. The chief French abbeys, *les quatre premières filles de Citeaux*, as they were called, were La Ferté, Pontigny, Clairvaux, and Morimond. Riches and indolence brought this powerful order, as well as others, into decay. Even before the reformation, many of their convents had ceased to exist.

CISTERN, a tank for holding water. In places where the supply of water is intermittent, or where rain-water is used, every house requires a C. or water-butt. Cisterns are much used for the supply of steam-engine boilers, at railway-stations. They are variously constructed—many of cast or wrought iron, of deal lined with lead or zinc, or of impervious pavement or slate slabs, in which last two cases the sides and bottom are grooved, and cemented together with white-lead putty, or some other cohesive substance, to prevent leakage; and the sides, if the dimensions be at all large, are frequently bound together by means of wrought-iron rods; but very large C.'s are generally made cylindrical, so that the pressure acting at all points equally from the center, the strain comes longitudinally on the outside, and tie-rods can be dispensed with. See WATER SUPPLY.

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CIT'ADEL (from the Italian *cittadillo*, "a little city") is a fort of four or five bastions, in or near a town. A C. serves two purposes: it enables the garrison of a town to keep the inhabitants in subjection; and, in case of a siege, it forms a place of retreat for the defenders, and enables them to hold out after the rest of the town has been captured. A C. must fully command the fortifications of the city, and have a large space round it clear of buildings.

CITATION, the act of calling a party into court to answer to an action, to give evidence, or to perform some other judicial act.

CITHAE'RON, MOUNT. See ELATEA.

CITHARA, a musical instrument in use among the ancient Greeks and Romans, in some respects resembling a guitar. In the cithara, the strings were drawn across the sounding bottom, whereas in the later forms of lyre they were free on both sides. That there was a difference between the lyre and the cithara is plain, since Plato and other ancient writers separate them. Again, the invention of the lyre was ascribed to Hermes, that of the cithara to Apollo. Further, the lyre invented by Hermes appears to coincide with the instrument known in later times as the cithara. (See the Homeric *Hymn to Mercury*.) The cithara and the phorminx would seem to have been closely similar, or even identical. In Grove's *Dictionary of Music and Musicians*, it is stated that the citnara was a *large lyre*, supported by a ribbon slung across the player's shoulders. The cithara when played rested on the knees, while the lyre stood upright between the knees. Sounds on the lower strings were produced by the fingers of the left hand, on the upper by the *plēktron*, a stick of ivory or polished wood. The cithara had a hollow body, sometimes of tortoise-shell, from which two horns branched upwards, carrying a cross-piece or yoke. The strings were stretched between the body and the yoke, a bridge being fastened on the body for their attachment. The term "lyre" has always been accepted as the generic name of this family of instruments and understood to include all varieties, the cithara as well as the *chelys*—a kind of small lyre.

CITHER. See ZITHER.

CITIZEN, an individual member of a state or government; one who owes allegiance to and may rightfully demand protection from it. The original meaning of the word, as denoting merely a resident of a city, has long since become quite secondary. In the ancient cities, such as Rome and those of Greece, the citizens were entitled to special privileges and immunities; and as the cities formed the type of free government in the ancient republics, by analogy the word soon came to mean one who possessed full civil and political rights. Both in ancient and modern times the word "citizen" has been in free countries applied to him who, under the general government, possessed a full share of political responsibility and duty. In a republic the word is used very nearly, if not quite, synonymously with the term "subject" under a monarchical form of government. In ancient Rome there were two classes of citizens—one that had a share in the sovereign power, the other possessing only the private rights of citizenship. Then, as in our republic, citizenship, though most usually acquired by birth, might be attained by special grant of the state. The idea of citizenship as understood in Greece, is defined by Aristotle, who declared a citizen to be one to whom belonged the right of taking part in both the deliberative or legislative and the judicial proceedings of the community of which he was a member. In the United States, the word citizen is used in its broadest possible sense, as defined at the beginning of this article. Perhaps as simple a statement as any is that made by an attorney-general of the United States when he said: "The phrase, a citizen of the United States, without addition or qualification, means neither more nor less than a member of the nation." The same person may be and usually is a citizen of the United States and of the state in which he resides. The two things are not, however, necessarily coexistent, for an inhabitant of one of the territories or of the District of Columbia is a citizen of the United States without being a citizen of a single state; and there are conceivable legal conditions which might make a man a citizen of a certain state without being a citizen of the United States. The idea of citizenship does not involve the right of voting, for women and minors may be citizens; accordingly, qualifications of age or sex may be precluded also from the idea of citizenship. The question of race does not now enter into the definition of citizenship; previous to the adoption of the Fourteenth Amendment this could not be stated, as the possession of negro blood was before that distinctly a disqualification from citizenship; yet even before the passage of the Fourteenth Amendment this position was doubted. The decisions denying the citizenship of Indians (or rather of some Indians), were founded not on race distinction, but on the existence of tribal relations, which were inconsistent with full allegiance to the United States. A citizen of the United States may be either native-born or naturalized. Among native-born citizens are included all persons born in the United States and not subject to any foreign power, including even the children of alien parents, unless the latter be ambassadors of a foreign power, but excluding untaxed Indians still in tribal relations; children born in foreign countries to fathers who were citizens of the United States at the time of birth; freedmen not recognized as citizens before the Act of Emancipation, but so recognized by that Act and by the ensuing Fourteenth Amendment; Indians born in this country who have abandoned tribal relations, have entered into civilized life, and have by paying

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taxes recognized their allegiance; Indians who have accepted lands in severalty under the so-called Dawes Bill of 1887. With the last-named class it appears to be the law that citizenship begins not from the date of the passage of the Act referred to, but from the time when the land is actually divided up and the allotment accepted. We have already said that minors and women are citizens in the meaning of the term found in the United States Constitution; it is also true that wives of citizens who were neither born in this country nor naturalized become citizens by their marriage, if they were not legally incapable of naturalization. A naturalized citizen is one who was originally a subject of a foreign state, but who has been received by the United States as a citizen under the Acts of Congress bearing on that subject. Theoretically, treatises on international law have always doubted the power of the subject to throw off his natural allegiance, and of a state to accept the allegiance of the subject of a foreign country. But the rights have been exercised, in point of fact, very generally; and the process of naturalization is now recognized by treaties in existence between the United States and many foreign powers. The statutes of the United States providing for naturalization, allow four classes of persons to take advantage of their provisions: those who have resided in the United States since June 18, 1812; those who have resided in the United States for a period of at least five years, and who legally declared an intention of becoming citizens of the United States more than two years before the time of naturalization; those who have resided in the United States continuously for five years, during three of which they had been minors; those who have served in the military forces of the United States and have been honorably discharged therefrom. A person belonging to any one of these four classes may come before a court, prove the necessary facts to the satisfaction of such court, and on taking the oath of allegiance provided for such cases, may be admitted to all the privileges and duties of citizenship. His naturalization includes that of any minor children resident at the time in the United States. In regard to the dual citizenship to the general government and to the state in which a person resides, it may be said that a citizen of the United States owes his first and highest allegiance to the general government. The relations of the two forms of allegiance have been defined as follows by the United States Supreme Court: "There is in our political system a government of each of the several states, and a government of the United States. Each is distinct from the others, and has citizens of its own, who owe it allegiance, and whose rights, within its jurisdiction, it must protect. The same person may be at the same time a citizen of the United States and a citizen of a state; but his rights of citizenship under one of these governments will be different from those he has under the other. The government of the United States, although it is, within the scope of its powers, supreme and beyond the states, can neither grant nor secure to its citizens rights or privileges which are not expressly or by implication placed under its jurisdiction. All that cannot be so granted or secured are left to the exclusive protection of the states. A citizen of the United States owes his first and highest allegiance to the general government, and not to the state of which he may be a citizen. A declaration of war, or the commencement of actual hostilities, between two states, *ipso facto*, dissolves the partnership relation existing between citizens of the hostile states." The word citizen is often loosely used as synonymous with resident or inhabitant. Where a law passed for a particular purpose, makes such loose use of the word, and where no question of constitutional rights is involved, the courts will interpret the word according to the intention of the law-makers. In common usage the inhabitant of a city, as distinguished from a resident in the country is often called a citizen; the term is also often applied to a private individual as distinguished from a civil officer or a soldier, being used instead of the word civilian.

CITRIC ACID, $C_6H_8O_7$, is a powerful tribasic acid, which crystallizes in large transparent colorless prisms. These crystals are readily soluble in water and alcohol, but are insoluble in ether. The crystals contain two molecules of water of crystallization (not expressed in the above formulæ), which are expelled at a temperature of 212° F. (100° C.). Citric acid has a strongly acid taste and reaction, and displaces carbonic acid from the carbonates. Its watery solution quickly becomes moldy on exposure to the air, and the acid is then found to be converted into acetic acid. When heated to about 350° F. (176° C.), vapor of acetone and carbonic oxide are given off, and a residue of aconitic acid ($C_6H_6O_6$), an acid occurring in the leaves and roots of monkshood and other species of aconite, is left; and when fused with potash, it assimilates the elements of water, and is decomposed into oxalic and acetic acids, as shown in the equation.

$$\overbrace{C_6H_8O_7}^{\text{Citric Acid.}} + H_2O = \overbrace{C_2H_2O_4}^{\text{Oxalic Acid.}} + \overbrace{2C_2H_4O_2}^{\text{Acetic Acid.}}.$$

These reactions illustrate the changes which organic acids naturally undergo in the vegetable kingdom. It is to the presence of C. A. that a great many fruits owe their agreeable acidity. It occurs in a free state either alone or associated with malic and tartaric acids in oranges, lemons, cherries, currants, raspberries, gooseberries, strawberries, whortleberries, etc., and in several tubers and bulbs, as in the potato and onion. It also exists in combination with potash or lime in potatoes, onions, and artichokes.

This acid, which is almost always prepared from lemon or lime juice, is thus obtained.

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The juice, after undergoing incipient fermentation, is filtered, and neutralized with chalk; and the insoluble citrate of lime thus formed is decomposed with very dilute sulphuric acid. On the removal of the sulphate of lime that is thus formed by filtration, the solution of C. A. must be concentrated till a film begins to form, when the crystals readily separate on cooling. Citric acid has also been prepared from unripe gooseberries, whose juice is allowed to ferment; and after the removal of the alcohol by distillation, the acid is separated in the way already described: 100 lbs. of gooseberries yield 10 lbs. of spirit of spec. grav. 0.928, and 1 lb. of crystallized acid.

Citric acid has been prepared synthetically thus: Glycerin, $CH_2(OH)CH(OH)\cdot CH_2(OH)$, is treated with hydrochloric acid gas, thus producing dichlorhydrin, $CH_2Cl\cdot CHOH\cdot CH_2Cl$, which is afterwards oxidized to dichloracetone, $CH_2Cl\cdot CO\cdot CH_2Cl$; this, treated with hydrocyanic acid (HCN), gives dichloroxyisobutyronitril, $CH_2Cl\cdot C(OH)(CN)\cdot CH_2Cl$; on heating the latter with aqueous hydrochloric acid it is converted into dichloroxyisobutyric acid, $CH_2Cl\cdot C(OH)(COOH)\cdot CH_2Cl$. The potassium salt of this acid, on being treated with potassium cyanide (KCN), gives the potassium salt of dicyanoxyisobutyric acid, $CH_2(CN)\cdot C(OH)(COOH)\cdot CH_2(CN)$, which, on being heated with aqueous hydrochloric acid, yields C. A., $CH_2(COOH)\cdot C(OH)(COOH)\cdot CH_2(COOH)$.

Citric acid is used largely in manufactures; calico-printers employ it for discharging the mordant from the cloth in patterns; and it is used in dyeing silk with safflower, and for heightening the tint of cochineal. The raw material from which the acid for these purposes is obtained "is a black fluid-like thin treacle, which comes from Sicily, and is obtained by inspissating the expressed juice of the lemon after the rind has been removed for the sake of the essential oil."—Watts's *Dictionary of Chemistry*, vol. i. p. 995.

The most important of the numerous salts of C. A. are the citrates of lime, potash, ammonia, and iron. *Citrate of lime*, $(C_6H_5O_7)_2Ca_3 + 4H_2O$, is formed in the preparation of C. A., and is a fine white crystalline powder, more soluble in cold than in hot water. *Citrate of potash* $(C_6H_5O_7K_3 + H_2O)$ is formed by neutralizing the acid with carbonate of potash, and crystallizes in clear deliquescent needles, insoluble in alcohol. *Citrate of ammonia* $(C_6H_5O_7(NH_4)_3)$ can only be obtained in solution. *Citrate of iron* is prepared by dissolving freshly precipitated peroxide of iron in a warm solution of C. A.; a reddish-brown solution is formed, which, on evaporation, yields brilliant scales of a light-brown color. Excepting the first, all these salts are employed in medicine—the citrates of potash and ammonia as diaphoretics and febrifuges (see AERATED WATERS), and the citrate of iron as a tonic. Lemon juice, in which C. A. is the most active ingredient, is a most valuable medicine in scurvy, active hemorrhage, rheumatism, etc.; and when it cannot be obtained, C. A. is the best substitute. The *magnesia citrica effervescens* of the drug stores consists of *Citrate of magnesia*, $(C_6H_5O_7)_2Mg_3 + 7H_2O$, mixed with sodium bicarbonate, C. A. and sugar.

CITRON (*citrus medica;* see CITRUS), a tree cultivated in the s. of Europe, and other warm, temperate, or sub-tropical countries for its fruit; a native of the forests of the n. of India. By many botanists, it is regarded as a mere variety (or perhaps the original type) of the species which produces also the lemon, sweet lemon, lime, and sweet lime; by others, these, or some of them, are regarded as distinct species. The C. has oblong toothed leaves; the flowers are externally of a violet color; the fruit is large, warted, and furrowed; the rind very thick and tender; the pulp sub-acid. The pulp is refrigerant; but the part chiefly valued is the rind, which has a delicious odor and flavor, and is made into a very agreeable preserve. The juice is sometimes employed to make a syrup, or, with sugar and water, for a beverage, and for flavoring liquors. The rind and juice may be said generally to be applicable to the same purposes as those of the lemon, but the juice is less acid. The CEDRATE is a variety of the C., from which chiefly the fragrant oil of C., or OIL OF CEDRATE, used by perfumers, is procured. In Germany, the name cedrate is extended to all kinds of C., and the name C. is usually given to the lemon. The varieties of C. are numerous. The fruit of the largest kinds is sometimes 9 in. long, and 20 lbs. in weight. The C. is frequently cultivated in Britain, and by the aid of artificial heat and the protection of glass is produced in great perfection.

It is probable that the C. is meant in some passages of the Old Testament where the word apple is used in the English version.

CITRONELLA, the name of an oil imported from Ceylon and used by perfumers, and also the name of a perfume prepared from common balm; and again, of a liquid brought from the West Indies, and used in France to flavor brandy.

CITRONWOOD OR CITRUS-WOOD. The most costly furniture wood of Roman antiquity, is usually regarded as derived from *Biota* (Thuja) *orientales*, or possibly from *Callitris quadrivalvis*, allied coniferous trees, both popularly known as *arbor vitæ* (oriental and African).

CITRUS, a co. in western Florida, on the Gulf of Mexico; organized, 1887, from part of Hernando co.; 592 square miles; pop. '90, 2394. The Withlacochee river forms the northern and eastern boundary. The surface is rolling in part; the soil fertile. Co. seat, Inverness.

CITRUS, a genus of plants of the natural order *aurantiaceæ*, consisting of trees and shrubs, natives of India and other warm parts of Asia, but many of which are now commonly cultivated in all warm climates on account of their fruit. To this genus belong the ORANGE, CITRON, LEMON, LIME, BERGAMOT, SHADDOCK, POMPELMOOSE,

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FORBIDDEN FRUIT, etc. See these heads. It is distinguished by numerous stamens, irregularly united in bundles by their filaments, a pulpy fruit with a spongy rind, and smooth seeds. The leaves and the rind of the fruit abound in volatile oil. The flowers also contain volatile oil, and exhale a peculiar fragance. See illus., TEA, ETC., vol. XIV.,

CITTADEL'LA, a t. of northern Italy, in the province of Padua, 14 m. n.e. of Vicenza. It is situated on the Brentella, an affluent of the Brenta, is walled, and has woolen and paper manufactures. Pop. 4,000.

CITTA' DI CASTELLO, a t. of central Italy, 25 m. n.w. of Perugia. C. has a very pleasant situation on the left bank of the Tiber. Though a place of only some 5,580 inhabitants, it is exceedingly rich in ecclesiastical structures of Gothic architecture, palatial residences, and works of art. Raphael painted many of his early works in C. di C.; and they were to be found in churches and private galleries here until the French invasion, when they were dispersed. Silk-twist is the chief manufacture of the town.

CITTA VECCHIA. See MALTA.

CITY (Fr. *cité*, Lat. *civitas*). In the sense in which it was first used in the Romanic languages of modern Europe, the word C., like its Latin original, was probably equivalent to state (q.v.) (*respublica*) rather than to town or borough (*urbs*, *municipium*); and whilst the latter signified a collection of hearths and households, governed by municipal laws internally, but subject externally to the laws of the country of which they formed a part, the former was applied only to such towns as, with their surrounding district, were independent of any external authority whatever. Nearly the only cities in this sense now are the free towns of Germany, and such of the cantons of Switzerland as consist chiefly of a town and its surroundings, for example, Geneva. But as the ancient Gauls, though composing one nation, were divided into tribes, living in different cantons, each with its town, to which the term *civitas* was applied, and as they also acknowledged a species of central authority, several cities sending delegates to a central one of greater extent and importance to discuss their common affairs, there is reason to believe that the term C. was applied *par excellence* to these central places of meeting, and that it thus, from a very early period, signified a *capital* or *metropolis*, though not independent.

In the case of towns which have grown greatly beyond their original dimensions, it is not unusual to give the name of C. to the space which they originally occupied—thus, we speak of the C. of London, the C. of Paris, or Vienna, etc.

In the U. S. a C. is a chartered municipal corporation whose chief executive officer is called the Mayor. The legislatures of the various states have prescribed different requisites to the granting of such charters, the principal limitation being that in regard to population. The various city charters confer different degrees of authority upon the officers who hold under them. In general there is besides the mayor, a board of Aldermen and a common council. Such a corporation has a clerk and a seal and its official acts are attested by them.

CITY POINT, a town on James river, in Bland district, Prince George co., Va., 10 m. n.e. of Petersburg, occupied during the war of the secession by the union army as the principal landing-place and depot for army supplies. Pop. '90, 409.

CITY OF REFUGE. The Jewish law (Numb. xxxv., Deut. iv., Josh. xx.) set apart six cities, three on each side of Jordan, as cities of refuge for the manslayer, in which he might find an asylum, and be safe from the avenger of blood. See BLOOD, AVENGER OF. These cities were Hebron, Shechem, and Kadesh-Naphtali on the w. of Jordan; Bezer, Ramoth-Gilead, and Galan, on the east. The Jews were careful to keep the roads to the cities of refuge clear, and signs were set up to show the way. The manslayer was received and protected in the C. of R. until the death of the high-priest, after which the avenger of blood had no longer any claim against him. Thus this peculiar institution was connected with the typical institutions of the Jewish religion, and partook somewhat of their character, whilst it modified and restrained the avenging of blood. The C. of R. afforded no permanent protection to the murderer, who, if his crime could be proved against him, was to be taken from it that he might be put to death.

CIUDAD' (from the Lat. *civitas*) is the Spanish word for "a city;" and is used as a prefix corresponding to the English affix *town*, as in

CIUDAD BOLIVAR. See ANGOSTURA.

CIUDADE'LA, a seaport t. of the island of Minorca, situated on a plain on the w. coast, in lat. 39° 58′ n., long. 3° 52′ east. It is walled, and has a cathedral, also several convents. The inhabitants, numbering between 8000 and 9000, are engaged in agriculture and the manufacture of woolen fabrics. A considerable trade is carried on at the port.

CIUDAD' REAL', a province in s. Spain; 7840 sq.m.; pop. '87, 292,291. The country consists chiefly of barren plains skirted by lofty hills and mountains, clad with forests, and inclosing deep valleys. The productions are wheat, rye, barley, corn, cattle, horses, asses, sheep, goats, etc. Iron, silver, copper, lead, cinnabar, coal, and marble are found in the mountains. The most famous of the mines is that of quicksilver at Almaden. Hot and cold mineral springs are also found. Considerable manufacturing

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is done in wool, linen, cotton, silk, soap, wine, and oil. The chief towns are Manzanares, Almodovar, Valdepeñas, and Calatrava.

CIUDAD REAL', a t. of Spain, capital of the province of the same name, situated on a plain between the rivers Guadiana and Jabalon, about 100 m. s. of Madrid. It is surrounded with walls in parts ruinous, and has some handsome houses; but, on the whole, it is a poor dull place. It has two or three fine churches—the nave of the parish church being one of the finest Gothic specimens of the kind in Spain—and several monasteries. There are manufactures to a small extent of coarse woolens, linen, and table-cloths, and a trade in the agricultural produce of the district. Pop. '87, 14,702.

CIUDAD RODRI'GO (Roderic's Town), a fortified t. of Spain in the province of Salamanca, about 50 m. s.w. of the city of that name. It is situated on an elevation above the river Agueda, which washes the walls, and is here crossed by a fine bridge. It has a cathedral, the earliest portion of which dates from the 12th century. The town generally has a mean appearance, and is not over-cleanly. During the peninsular war, C. R., though of little strength itself, was considered a place of the utmost importance, as a key of Spain on the w., and was consequently an object of ambition both to the French and the allies. In June, 1810, the French under Massena invested the town, and after a gallant defense by the Spaniards, it was forced to surrender on the 10th July. The fact that Wellington was in the immediate vicinity with an army of 30,000 men, and afforded no relief whatever, was a subject for outcry against the hero; but subsequent events at Torres Vedras showed that his policy was the right one. In Jan., 1812, after a siege of 11 days, the place was assaulted, and after a bloody struggle, the British succeeded in capturing the town. The storming is one of the most brilliant achievements recorded in British military annals, and important as it was brilliant; 150 guns fell into the hands of the captors, besides vast stores of every kind, and the moral effect was even more than proportionately great. Population, '87, 8330.

CIVET, *Viverra*, a genus of carnivorous quadrupeds, of the family *viverridæ* (q.v.), having the body elongated, in some of the species as much as in the weasel tribe; the head is also long, and the muzzle sharp. The ears are short, broad, and rounded. The feet have five toes, and the claws are only semi-retractile. There is a more or less conspicuous erectile mane along the back, as in hyenas. Between the anus and the sexual organs, in both male and female, there is a large double pouch, in which is secreted a peculiar odoriferous fatty substance, called *civet*, much used as a perfume. The use of this pouch and its secretion to the animal is not very well known. There are several species of C., of which the best known is the common or African C. (*V. civetta*), a native of the n. of Africa. The common C. is from 2 to 3 ft. long. The height is from 10 in. to a foot; the hair long, brownish gray, with numerous black bands and spots. The C. preys on birds, small quadrupeds, and reptiles, and generally takes its prey by surprise. It is very commonly kept in confinement for the sake of its perfume, which is removed from the bag about twice a week by means of a small spatula, and is obtained most abundantly from the male, and especially after he has been irritated. A dram is a large quantity to obtain at a time. The civets kept for this purpose are fed on raw flesh; the young partly on farinaceous food. See illus., DEER, ETC., vol. IV.

CIVIALE, JEAN, 1792–1867; a surgeon b. in Auvergne, and a pupil of Dupuytren at the hospital of the Hotel Dieu in Paris. He was the discoverer of that process of lithotrity, by which the stone in the bladder is crushed and the fragments removed through the natural channel. He was a member of the leading societies, and an officer of the legion of honor. He published a number of works, all relating to his discoveries and practice in lithotrity.

CIVIC CROWN, considered among the Romans more honorable than any other reward. It was given for saving the life of a citizen in battle or assault. It was given to Cicero for his discovery of Catiline's conspiracy, and to the emperor Augustus. The C. C. was merely a wreath, at first of twigs of elm, then of beech, and lastly of oak. The one to whom it was given had the right to wear it always. When he appeared in public, if senators were present, they rose to do him honor, and he was excused from all troublesome duties and services, with the same immunities for his father and his father's father.

CIVIDA'LE, a walled t. of Venetia, Northern Italy, about 10 m. e.n.e. of Udine, situated on the Natisone, which is here crossed by a bridge. C. is the ancient *Forum Julii*, and its collegiate church, a fine Gothic edifice, dates from the 8th century. In its archives are contained some valuable manuscripts. It has silk and cotton factories, and a population of some 8000.

CIVIL DEATH, the extinction of the legal and civil rights belonging to an individual as a member of society. In the United States, civil death can occur only as the result of a sentence of imprisonment for life. Shorter sentences of imprisonment, while they may temporarily suspend the rights of the prisoner, do not extinguish them. But in former days, under the English law, there were several cases where civil death ensued, and where a man was cut off from his rights of protection by the state as completely as

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if he were physically dead. This was the consequence of attainder for treason or felony, of abjuring the realm, or of entering upon a monastic life. Thus one who became a monk or nun was considered so absolutely dead in law that an heir could succeed to his or her estate. In some Roman Catholic countries this still holds true.

CIVIL ENGINEER. See ENGINEER.

CIVIL ESTABLISHMENTS, of the army, comprise certain departments which, though provided for out of the army estimates, are non-military in their organization; such as those connected with the manufacture of munitions of war.

CIVILIAN. This term has three meanings, which are distinct, though intimately related. 1. In a popular sense, it signifies a person whose pursuits are civil; i.e., neither military nor clerical. 2. As a law-term, it means, either a person who is versed in the principles and rules in accordance with which civil rights may be freely, blamelessly, and successfully vindicated in society generally, or in the particular state in which he belongs; or 3. One who has made a special study of these rules and principles as exhibited in the laws and government of Rome (the Roman civil law). The civil law of Rome exercised such influence upon the formation of the municipal systems of almost all the states of modern Europe, that those who devoted themselves to its study were regarded as "civil" or municipal lawyers *par excellence*. From the more learned training which this study demanded, C. came often to be used as synonymous with professor or doctor, as opposed to practitioner of law; the former being generally more deeply versed in the Roman law than the latter; and this in its turn led to its being loosely applied to the international lawyers of the 17th c. (Grotius, Puffendorf, etc.), who generally belonged to the class of civilians in the sense of Romanists, and who, though their subject was altogether different, quoted largely and derived many analogies from the Roman jurisprudence. At present, from our having in this country no class of persons who prosecute law as a *science* as opposed to an *art*, the term C. has reverted to its narrower mediæval sense of student or teacher of the Roman civil law, and thus we speak of Savigny as a C., but not of Story. The special sense in which C. is understood in England will be explained under ECCLESIASTICAL COURTS. See also ADMIRALTY COURTS.

CIVILIS, CLAUDIUS, a chief of the Batavi, and for twenty-five years connected with the army of Rome. Alienated by unjust treatment and by the execution of his brother, Julius Paulus, he in 69 A.D. headed in Gaul an insurrection, but was finally subdued by an army under Cerealis. Tacitus extols his patriotism and heroic acts.

CIVILIZATION. This is a general term to designate the condition of the more advanced nations, as contrasted with those that are looked upon as barbarians or savages. We term the leading nations of Europe civilized; the Chinese and Tartars less so; the Red Indians, Australians, Esquimaux, least of all. "Whatever be the characteristics of what we call savage life, the contrary of these, or the qualities which society puts on as it throws off these, constitute civilization. Thus, a savage tribe consists of a handful of individuals, wandering or thinly scattered over a vast tract of country; a dense population, therefore, dwelling in fixed habitations, and largely collected together in towns and villages, we term civilized. In savage communities, each person shifts for himself: except in war—and even then very imperfectly—we seldom see any joint operations carried on by the union of many; nor do savages in general, find much pleasure in each other's society. Whenever, therefore, we find human beings acting together for common purposes in large bodies, and enjoying the pleasures of social intercourse, we term them civilized." And so of other characteristics.

When we come to seek for an exact definition of the term C., we meet with a variety of views, implying that there is a certain complication in the subject. The original derivation of the word points to that polish of manners that distinguishes the inhabitants of cities (Lat. *cives*) from the rustic population; but the use of the word has greatly outgrown this limitation. Guizot has given a definition, which has become generally known, to the effect that we are to include in C. the improvement of man both socially and in his individual capacity. But the chief difficulty lies in settling what is *improvement*. That people are far from agreed on this point is evident from the use of the phrase, "vices of civilization." How are we to distinguish its vices from its virtues?

The question is very much simplified by making a distinction between *aiming at* the improvement of mankind and really *effecting* that object. All our inventions and discoveries, and all our new arrangements introduced into every department of life, are intended to raise us further and further above the savage condition; nobody denies this; but there may be the widest difference of opinion as to whether any one new device is a real improvement. If we were to restrict the term C. to the changes introduced into human life *with a view* to improvement, the definition of it would present no difficulty, whereas the relation of this to *progress*, or actual improvement, must ever remain open to difference of opinion.

Leaving out of view for the present the disputable matter, C. may be explained as follows: In the first place, there are certain things bearing decidedly on human preservation and human happiness that are to be excluded from the definition. C. is *not* natural advantages—such as those of soil and climate; or the goodness of the mental or bodily constitution of the race; or accidents of fortune favoring our exertions; or individual dexterity or skill that cannot be imparted. It is not necessarily happiness, which

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is sometimes present in a low C. and absent in a high. *The permanent changes in the condition and arrangements of man's life effected by his own intelligence and exertions* make up human civilization. It is the *artificial* half of the good we enjoy. Nature has given us so much; our own powers of contrivance give the rest. Genius (in the sense of intellectual originality) is the cause, and C. the effect.

Such being the general definition, the enumeration of the separate departments is the enumeration of the institutions of civilized life. These may be briefly summed up under the following heads:

1. The *industrial arts*, or the devices fallen upon for turning to advantage the material resources and agencies of the globe. Perhaps no one will be found to dispute that these constitute real improvements.

2. The *government*, or system of political organization. It is here that we are most forcibly convinced of the propriety of distinguishing C. from *absolute progress*, or the devices intended for improvement from actual improvement. Scarcely anything in the whole political system of Great Britain, for instance, has commanded unanimous approbation first and last; nearly all the changes have been carried against reluctant minorities, and every now and then voices are raised against institutions accounted by the mass of the nation the very bulwark of our national greatness; as, for example, the parliamentary control of the sovereign authority.

One aim of social reformers has been to make the necessary functions of government compatible with a larger and larger range of individual liberty. The majority of men call this state of things not merely an intended but a real improvement; not merely C., but progress. Still, there is never wanting a class of minds that see only the disadvantageous side of this and all other social innovations.

Connected with liberty, we may also notice the growth of human sentiment in all classes, the governing power included. When we revert to the horrible punishments to which men were subjected in this country not many generations since, not only for real crimes, but out of mere superstitious antipathies, as in the burning of witches, we are apt to feel ashamed of our own ancestors, and to congratulate ourselves on having our lot cast in a milder age.

3. The *arts of social intercourse*, embracing the material machinery of conveyance and communication; and also what may be called the moral machinery, such as forms of procedure for regulating assemblies, and the minor courtesies of life.

4. The scheme of *morality* established in a community appertains to their civilization. But in this, also, difference of opinion prevails, when we compare different countries and times. Morality, in fact, has always been more or less a part of *religion*, which must also be viewed as an institution pertaining to civilized men, whether of their own invention or the result of supernatural communication. In any case, there is mixed up with every religion much that is purely human, and which may be judged of by its tendencies to promote human welfare, like any other arrangement of society. This being the subject of all others that men have most differed upon, no criterion of progress can be laid down, because none would be universally received. The unconverted pagans alive at the final establishment of Christianity, naturally believed that the human mind was thrown backward by that event.

5. *Science* is the least disputed of all the ingredients of civilization.

6. *Literature* and the *fine arts* make part of the C. of mankind. They are a new class of pleasures, superadded to the gratifications of mere sense, and of a kind that can be partaken equally by a large number of people. Instead of rivalry and contention, which are inseparable from the struggle for food, money, or power, the arts tend to sociability and good-fellowship. Every contribution to architecture, painting, music, etc., is a result of human genius, and intended for human pleasure; but there is not the same unanimity in this case as in the former; for many kinds of art are objected to as corrupting the mind; and too great a devotion to art, on the whole, is said to endanger the just balance of men's regards to the serious interests of life.

The above enumeration will amply show how to define the term C., and of what parts the total is made up. It has also been made apparent that the point as to whether any invention be an item of genuine *progress*, is, and ought always to be, an open question. The inventions of original minds intended for placing us further and further from the savage condition, and having that effect, may often be accused of producing new evils, which other arrangements are called for to neutralize. See works on the history of C. by Guizot, Draper, Buckle; on the anthropological side, Lubbock's *Origin of C.*

CIVIL LAW. See LAW.

CIVIL LIST. Down to the period of the restoration in 1660, notwithstanding an attempt at negotiation between James I. and the parliament for the commutation of the hereditary revenues of the crown, the whole expenses of the government of England, civil and military, were included in one list, or rather they were defrayed out of what was called the royal revenue. This revenue arose partly from crown-lands, and partly from other sources, and for a long period after the conquest, it was really at the disposal of the crown. Even after the supplies were provided by parliament, the specific mode of their expenditure continued to be free from parliamentary control. But at the restoration a distinction was made (by statute 12 Charles II.) between the extraordinary

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expenses occasioned by war, and the ordinary cost of the civil establishments of the country. For the latter, the needful funds were provided, partly from such crown-lands as were still unalienated, and partly from taxes which parliament voted for the purpose at the commencement of each reign. These were called the hereditary or C. L. revenues. During the reign of William III., the C. L. amounted to £680,000 annually. The branches of expenditure included under this head were the following: 1. The royal household; 2. The privy purse; 3. The royal palaces; 4. The salaries of the chancellor, judges, great officers of state, and ambassadors; 5. The incomes given to the other members of the royal family; 6. The secret-service money, pensions, and other irregular claims. The support of the army and navy was now provided for by an annual vote of the house of commons, and the interest of the national debt was never charged against the civil list. During queen Anne's reign, matters remained nearly on their former footing; but on the accession of George I., the C. L. was raised to £700,000 a year, and on that of George II., to £800,000. George III., notwithstanding that he had surrendered very large portions of the remaining hereditary revenue of England, accepted the last-mentioned sum. But it proved insufficient for the purpose. A large amount of debt was incurred, and in 1769 and 1777, parliament voted sums for his relief, amounting together to more than £1,000,000. In 1777, the C. L. revenue was raised to £900,000, but further deficiencies to the extent of £270,000 had still to be supplied by extraordinary votes. In 1780, Mr. Burke succeeded in abolishing several useless offices, and reducing the expenditure. Notwithstanding these and other efforts in the same direction, it was found indispensable continually to augment the C. L. revenue. In 1804, it was raised to £960,000, and in 1812, to £1,080,000, besides annuities to members of the royal family, which were now paid out of the consolidated fund (q.v.) to the amount of £260,000. When George IV. succeeded to the throne, £255,000 of expenditure was transferred to other funds, and the C. L. was then fixed at £850,000 per annum. The crown enjoyed, in addition, the hereditary revenue of Scotland, amounting to about £110,000, and a separate C. L. was kept up for Ireland of £207,000. Against these large sums, however, were still placed many charges which belonged to the nation rather than the crown; and it was not till the 15th Nov., 1830, that sir Henry Parnell, afterwards lord Congleton, carried a motion for the appointment of a select committee for the purpose of separating the proper expenses of the crown from all other charges. The result of this measure was the act (1 Will. IV. c. 25) for the regulation of the civil list. The sum of £510,000 was now granted to his majesty, and exclusively devoted to the privy purse, the salaries and expenses of the household, secret-service money, and pensions. The separate list for Ireland was discontinued, and the Scotch hereditary revenues and other items were directed to be paid into the exchequer. The change was rather a new distribution, which enabled the country to look more closely into its expenditure, than a real reduction of the civil list.

On the accession of Queen Victoria, the C. L., which had long been of the nature of a compact between the monarch and the parliament, and as such beyond the control of parliament during the life of the sovereign, was settled by 1 and 2 Vict. c. 2. The queen surrendered the hereditary revenues of the crown for life, in consideration of a yearly sum of £385,000, to be devoted solely to the support of her majesty's household, and the honor and dignity of the crown. The application of this sum to the particular branches of the queen's privy purse, the salaries and expenses of the household, the royal bounty, alms and special services, is intrusted to the lords of the treasury; and it is provided that if the C. L. charges in any one year shall exceed the total sum of £400,000, an account of the particulars of excess shall be laid before parliament in thirty days. Besides the above sum, £1200 a year is intrusted to her majesty for the payment of pensions, "to persons who have just claims on the royal beneficence, or who, by their personal services to the crown, by the performance of duties to the public, or by their useful discoveries in science, and attainments in literature and the arts, have merited the gracious consideration of their sovereign and the gratitude of their country."

CIVIL SERVICE is a general name used in England for all the duties paid for by the state, other than those relating to naval and military matters. At the head of the British C. S., which numbers above 50,000 officials of all grades, are placed the officers of the royal household, under several departments. Then come the officers of the house of lords and the house of commons. Then a vast number of offices or departments, of which the following are the more important: Treasury, home office, foreign office, colonial office, India office, war office, admiralty, board of trade, post-office, customs, inland revenue (including stamps, taxes, and excise), exchequer and audit office, office of woods and forests, office of works and buildings, duchy of Lancaster, public record office, local government board, education department, civil service commission, registrar-general's office, stationery office, ecclesiastical commission, charity commission, patent office, emigration office, Trinity house, heralds' college, law and equity courts, ecclesiastical and admiralty courts, prisons department, British museum, science and art department, diplomatic and consular corps. Several departments peculiar to Scotland and Ireland form distinct lists, not included in the above.

The heads of most of the departments are political officers, changing with the ministry. Others, such as the head of the exchequer and audit department, or the commis-

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sioners of customs and of inland revenue, are permanent officials. Excluding the judicial offices, and a few departments where special knowledge is required, the C. S. is open to the public generally, the principle of open competition being in force as regards most of the departments.

In former times appointments to the government offices were obtained mostly by favor; but now, merit and abilities are conditions superadded. By an order in council, dated May 21, 1855, the system was first placed on a new basis, and a commission was appointed to examine all candidates for the service. A candidate being *nominated*, the commissioners in due time notified that he must come up to be examined, and produce certificates of birth, health, and character. The heads of the several departments agree with the commissioners as to the extent and nature of the subjects on which candidates should be examined. The commissioners neither nominate nor appoint; they only examine, and notify the result of the examination.

By an order in council, dated 4th June, 1870, the regulations were altered, the rule of open and unrestricted competition being then introduced, qualified by some exceptions. In certain small and special offices, nomination with subsequent success at an examination remained the rule of entry. But for all the principal departments—the foreign office being the only prominent exception—there is open competition, to which all British subjects of the required age and of good health and character, are admissible. For offices of the superior grade, the age is from 18 to 24, and in the lower division, the age is from 17 to 20. Boy clerks must be over 15 and under 17. Any successful candidate remaining on the list without obtaining an appointment, is struck off at the age of 25. Boy clerks who at 19 fail to obtain appointments as man clerks are also struck off. The first open competition held was on 22d Feb., 1871, when 30 situations in the excise were competed for by a large number of candidates. A further change was made by the introduction of "writers"—a species of "uncovenanted" clerks, who were paid by the hour, were dismissible at pleasure, and had no claim to pension. Writers were first introduced in Aug., 1870, and "boy clerks" were sanctioned in July, 1870.

These various changes (tending in the opinion of the service to lower the status of the officers) and the increased cost of living resulted in great agitation throughout the C. S., and in the appointment of a commission under Dr. Lyon Playfair, to reconsider the whole system of C. S. organization and pay. Following on reports from this commission, considerable changes were made. The decision that the lower grade should have no claim to rise above £200 a year, or to obtain promotion into the higher grade, and the introduction of "duty-pay" as a means of rewarding special responsibilities, may be named amongst the chief alterations.

CIVIL SERVICE REFORM. (See CIVIL SERVICE.) This, in its widest sense, would mean the reform of all abuses in the federal and municipal administrations. But in the restricted sense in which it has been used of recent years it means the reform of those abuses in the civil service that have resulted from the "spoils system," the system which, deriving its name from the famous phrase attributed to Pres. Jackson, "to the victors belong the spoils," assumes that the offices are the property of the party in power, and should be distributed among its members as rewards for party fealty, and for perpetuating party supremacy. The civil service reformers, on the other hand, claim that the test of personal fitness, irrespective of partisan politics, is the only test that ought to be applied to the vast majority of office-holders. In their favorite phrase "public office is a public trust created only for the common benefit," and no party affiliations should enter into the selection of any officials except where it can be shown that their opinions are a necessary element in the faithful discharge of their duties. A president, a governor, even a mayor, is elected as an embodiment of certain principles that are believed in by the majority of his constituents, and it is conceded to be indispensable not only that he himself should have faith in those principles, but also that the chief officials who surround him and assist in shaping or in representing his policy should assent to the same principles. The president's cabinet, for example, should belong to the party that elected him. But an inquiry into the political complexion of the government's errand boys, or washerwomen, would be absurd. Now somewhere between the president's cabinet and the errand boy or washerwoman in the great army of 150,000 federal officeholders, a line of demarcation can be drawn, and all who fall below that line must be chosen not because of their political opinions but because of their fitness for the purely clerical duties of the position, their ability to give the people of the nation, who are their real employers, an equivalent for the salary that comes out of the people's pockets. The best way of testing their fitness, in the opinion of the civil service reformers, is by a written or oral examination, to which some would add a six-months' trial in the duties of the position before final engagement. Another important part of the proposed reform is that tenure of office shall be during good behavior. The civil service reformer insists that experience increases the skill of the office-holder and his consequent value to his employer; and that, moreover, the consciousness that his position does not depend upon the will of the dominant party would prevent the enforced political assessments and other scandals of the present system. The degradation of the civil service, indeed, dates from the time when tenure of office was made virtually arbitrary. Before 1820 there was a tacit understanding that the office-holders whose

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duties were merely clerical and not political in the partisan sense, should retain their positions through all mutations of party. But in that year a law was passed limiting to four years the tenure of all accounting officers, *i. e.*, those charged with the receipt and disbursement of public money. The effect of this was to place in the hands of the president the power of arbitrary removal without the odium that had hitherto attached to it. When Andrew Jackson became president in 1828, he was quick to avail himself of the privilege, and he made sweeping changes among the office-holders for the purpose of rewarding his own adherents. The precedent thus established was followed by succeeding administrations. In 1853 an effort was made to stem the resulting abuses by an act which provided for pass examinations as a pre-requisite for holding certain offices. But the politicians, while keeping to the letter of this law, managed to evade its spirit, the examinations degenerated into a farce, and were ultimately abandoned. During Pres. Grant's first term of office the numerous scandals that came to light in regard to the distribution of federal patronage, caused him, in 1872, to appoint a committee to devise rules which should govern admission to and promotion in the public service. For a period he guided himself in his appointments by the rules laid down by this commission, but in the end he yielded to the pressure brought to bear upon him by politicians interested in the old system, and formally abandoned in 1875 the attempt at reform not as yet sustained by sufficient public sentiment. But public opinion was now aroused on the subject, and in the national convention of 1876, and again in that of 1880, both parties were obliged to profess adherence to the proposed reform. Little was really done, however, until Jan., 1883, when an act of congress was passed for the regulation and improvement of the civil service of the U. S. This law, known as the civil service act, provides for the appointment of three commissioners whose duties are, among others, to aid the president in carrying the act into effect, and to provide rules and opportunities for open competitive examinations as to the fitness of applicants for all subordinate places in all custom-houses and post-offices in which there are as many as 50 office-holders and in all the departments at Washington. The act further provides that no person in the public service is for that reason under any obligation to contribute to any political fund or render any political service, nor has any person in the public service a right to use his official authority to influence or coerce the political acts of another. The commissioners also prepared rules for the regulation and improvement of the service. In the same year a similar law was passed in the state of N. Y. to regulate appointments to municipal offices in all cities of over 50,000 inhabitants. This was amended, 1884, to all cities of over 20,000 inhabitants. Other states are agitating measures of the same kind, and it is the hope of the civil service reformers to see their system established before long in every progressive state in the Union. Meanwhile, there are not lacking those who declare the whole movement an impracticable chase after an ideal, while others see in it the danger of building up a permanent class of privileged officials, beyond the easy reach of the people whom they are paid to serve. Whatever the theorisers on either side may say, it is evident that the present mood of the people is to give this reform the test of a full experiment.

The Civil Service rules of the United States require that applicants for examination shall be citizens of the proper age, and that no discrimination shall be made on account of sex, color, or political or religious principles, but impose the following limitations of age: For the Departmental Service, an applicant must not be under twenty years; in the Customs Service, not under twenty-one years, except clerks or messengers, who must not be under twenty years; in the Postal Service, not under eighteen years, except messengers, stampers, and other junior assistants, who must not be under sixteen nor over forty-five years of age, and carriers, who must not be under twenty-one or over forty, and in the Railway Mail Service, not under eighteen or over thirty-five years. Persons honorably discharged from the military or naval service, by reason of disability resulting from wounds or sickness incurred in the line of duty, do not come under the age limitations, but are preferred under §1754 R. S. An applicant for examination must file an application blank obtained from the Civil Service Commission at Washington, if intending to enter the Departmental or Railway Mail Service; or from the Customs or Postal Board of Examiners at the office where service is sought, if wishing to enter the Customs or Postal Service. These papers must be returned to the officers from whom they emanated. The clerk examination, used in the Customs and Departmental services for clerkships of $1000 and upwards, is limited to the following subjects: orthography, penmanship, and copying; second, arithmetic, fundamental rules, fractions, and percentage; third, interest, discount, and elements of book-keeping, and of accounts; fourth, elements of the English language, letter-writing, and the proper construction of sentences; fifth, elements of the geography, history, and government of the United States. The "Copyist Examination," for employés in post-offices and those below the grade of clerks in custom houses, and in the departments at Washington, omits the third and parts of the fourth and fifth subjects. Applicants claiming military or naval preference need obtain but 65 per cent. of complete proficiency in order to be certified for appointment; all others must have a standing of at least 70 per cent. Persons passing an examination are graded and registered. In case a vacancy occurs, the names of the

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three persons graded highest on the proper register of those in the appointing officer's branch of the service are reported by him to the Commission or proper examining officer, and from these three, one is selected. If, at the end of six months, the conduct and capacity of this person have proved to be satisfactory, the appointment is made absolute. The service classified under the Civil Service Act, and to which it and the rules apply, embraces the executive departments at Washington, the Department of Labor and the Civil Service Commission, the customs districts, in each of which there are fifty or more employés, the post-offices in which there are fifty or more employés, and the Railway Mail Service, including (1891) about 32,000 places. The exceptions from examinations include confidential clerks of heads of departments or offices, cashiers of collectors and of postmasters, custodians of money for whose fidelity another officer is under bond, disbursing officers who give bonds, and persons in the secret service.

CIVITA CASTELLA'NA, a t. of central Italy, about 30 m. n.e. of Rome. It has about 5,000 inhabitants; is picturesquely situated on a plateau of volcanic tufa above the Rio Maggiore; has an old cathedral, and a citadel, now used as a prison. It is, however, chiefly remarkable on account of the vast number of its Etruscan remains. It occupies the site of the ancient *Falerium Vetus*, one of the 12 cities of the Etruscan league; and *Falerii Novi*, of which also there are many remains, stood about 4 m. to the n. of Civita Castellana.

CIVITANO'VA, a t. of central Italy, province of Macerata, 12 m. w. of the town of Macerata. Pop. about 9,000. It stands not far from the Adriatic, and has a fine harbor, much frequented. Its lands produce vines, olives, and pasturage. It is an industrial and commercial city.

CIVITA SAN-AN'GELO, a t. of s. Italy, in the province of Teramo, situated near the Adriatic, about 25 m. s.e. of Teramo. It has a pop. of 3,000, and an active trade.

CI'VITA VEC'CHIA, an Italian city in the province of Rome, is situated on the Mediterranean, in lat. 42° 4′ n., long. 11° 45′ e. Its ancient name was *Centum Cellæ*. The harbor of C.V. is one of the best in Italy, and was constructed by the emperor Trajan; the town, indeed, owed its origin entirely to the port of this emperor, and hence it was also known as Portus Trajani. The harbor is formed by two artificial moles projecting into the sea, while a third constructed between the two serves to protect the harbor from the heavy sea; upon this third and outward mole there is a good light-house, some 80 ft. above the level of the sea. Within the port there is a small dock and arsenal. The town of C. V. is small, and has no buildings of any note except a large church in the principal street. The streets are ill paved and narrow, and the inhabitants poor. Pop. about 12,000. It is a free port, and is regularly visited by steam-packets from Marseilles, Leghorn, Naples, Genoa, Messina, and Malta; while the majority of travelers visiting Rome land here. It is famous among the modern Italians for its oysters, which are extremely small, but delicious to the taste.

CIVITEL'LA DEL TRON'TO, a t. of s. Italy, in the province of Teramo, 10 m. n. of Teramo. It is situated on a rock, is fortified and defended by a strong castle. C. del T. is historically interesting as the place where, in 1053, Robert Guiscard and his Normans gained a complete victory over the forces of pope Leo IX. and the emperor Henry III. of Germany; and also for the siege it sustained in 1557 against the French and papal army under the duke of Guise, who was finally forced to retreat.

CLABBER. See BONNY-CLABBER.

CLACKAMAS, a co. in n.w. Oregon, w. of the Cascade mountains, drained by the Clackamas and Willamette rivers, and intersected by the Southern Pacific railroad. Area, 1684 sq. m.; pop. '90, 15,233. It is heavily timbered and has a fertile soil. The chief productions are agricultural. Co. seat, Oregon City.

CLACKMAN'NAN, the co. t. of Clackmannanshire, in the s. part of the co., on the Devon, near its confluence with the Forth, 9 m. e. of Stirling. It lies on ground rising 190 ft. above the rich carse-land of the plain of the Forth, which is also rich in coal, iron, and limestone.

CLACKMAN'NANSHIRE, the smallest co. of Scotland, bounded n. and w. by Perthshire and the Ochil hills; e. by Perthshire and Fifeshire; s. by the Forth, separating it from Stirlingshire. Its greatest dimensions are 10 by 8 m.; area, 48 sq. miles. Pop. '91, 33,140. It chiefly consists of the valley of the North Devon, gently declining from the green Ochil hills to the Forth. The Ochils consist of trap, especially amygdaloid, claystone, porphyry, and greenstone, and rise in Bencleugh (more properly, Benclach) 2,352 ft., and Dunmyat, or Demyat, 1345. A ridge of high ground, with inferior soil, often resting on clay, runs w. through the middle of C., between the very fertile alluvial lands resting on the coal-measures in the s., and the North Devon valley in the n., where the soil is loamy, and rests on gravel, and also on the coal-measures, which extend to the base of the Ochils. The chief minerals are ironstone, sandstone, greenstone, coal, limestone, silver, copper, antimony. The chief rivers are the North Devon, rising in the s. of Perthshire, and the Black Devon, rising in the s.w. of Fifeshire; both run w. across C. into the Forth. The river Forth is navigable for small vessels up to Alloa. The chief towns are Clackmannan, the co. town; Alloa, the most important place; and

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Dollar, noted for its endowed academy. C. with Kinross-shire, returns one member to parliament.

CLA'DIUM (Gr. *clados*, a branch or twig), a genus of plants of the natural order *cyperaceæ*, of which one species, *C. mariscus*, is a native of Britain, particularly common in the bogs and fens of Cambridgeshire, where hundreds of acres are almost entirely covered with it. It is 3 to 5 ft. high, with a rounded leafy stem, the keel and margins of the leaves rough and almost prickly. It is consequently hurtful to cattle. It is used for thatching, and in Cambridgeshire also for lighting fires. The English name twig-rush has been given to it, but is only of recent invention.

CLADRAS'TIS, a small leguminous tree, resembling the common locust, having a yellow bark with cathartic properties. It is variously called yellow wood, yellow ash, yellow locust, and fustic.

CLAFLIN, WILLIAM, b. Mass., 1818; engaged in mercantile pursuits; was in the state house of representatives, 1848–52; state senator, 1860–61; pres. of senate, 1861. C. was chairman of the republican national executive committee, 1868–72; lieut.-gov. of Mass., 1866–69; and gov., 1869–71. He was elected to the XLth congress as a republican.

CLAGGETT, THOMAS JOHN, D.D., 1742–1816; a native of Maryland, ordained in England, and the first Protestant Episcopal bishop consecrated on this side of the Atlantic. In 1792 he was consecrated bishop of Maryland; in 1800 he was chaplain to the U. S. senate; and in 1808 he became rector of Trinity church, Marlborough, Md.

CLAIBORNE, a parish in n.w. Louisiana, on the Arkansas border; 800 sq. m.; pop. '90, 23,312, includ. colored. It has an undulating surface, partly covered with timber. The chief productions are cotton, corn, wool, and sweet potatoes. Co. seat, Homer.

CLAIBORNE, a co. in s.w. Mississippi, on the Mississippi and the Big Black rivers; 452 sq. m.; pop. '90, 14,516, includ. colored. The surface is uneven and the soil is fertile, producing corn, potatoes, cotton, etc. Co. seat, Port Gibson.

CLAIBORNE, a co. in n.e. Tennessee, on the Kentucky border, bounded s. by Clinch river; 472 sq. m.; pop. '90, 15,103, includ. colored. It has a rough, mountainous surface, but fertile soil, with mines of lead, zinc, and iron. The chief productions are agricultural. Co. seat, Tazewell.

CLAIBORNE, or CLAYBORNE, WILLIAM, American colonial statesman, b. in England about 1589, went to Virginia in 1621, and was appointed by Charles I., secretary of state for that colony in 1625. He founded a trading-post on Kent island in 1631 which developed into a flourishing community. For this settlement he secured a representative in the general assembly of Virginia. C. was involved in a dispute with the governor of Maryland, who claimed Kent island as a part of the latter colony. After the execution of Charles I., Virginia having decided in favor of Charles II., C. at his own request was sent as commissioner to reduce the colony. In this he was successful, and he re-established the religious tests excluding Catholics from holding office. He was secretary of state in the new Roundhead government, with Richard Bennet as governor. On the restoration of Charles II., he was neglected by the court, and passed the remainder of his life in obscurity, dying in Virginia about 1676.

CLAIM, in English law, is a challenge of interest in anything that is in the possession of another, or at least out of a man's own possession. Claims are either verbal or by action, and relate either to lands or to goods and chattels; their object being generally to preserve a title which otherwise would be in danger of being lost.

CLAIM OF LIBERTY is a suit or petition to the queen in the court of exchequer, to have liberties and franchises confirmed there by the attorney-general (Tomlins' *Law Dic.*).

CLAIMS, COURT OF, in the United States, created by act of congress, Feb. 24, 1855, and consisted of three judges appointed by the president and senate, to hold office during good behavior, and to have jurisdiction to hear and determine all claims founded upon any act of congress, or on any regulation of any executive department, or upon any contract, express or implied, with the government of the United States; and all claims which might be referred to it by either house of congress. The United States were represented before it by a solicitor and assistant-solicitor appointed by the president; the solicitor being authorized to appoint a deputy, and the compensation of all members of the court was fixed by law. The court had no power to render a judgment which it could not execute, but reported to congress the cases upon which it had finally acted, the material facts which it found established by the evidence, with its opinion in the case, and reasons therefor, or what was equivalent to an opinion in the return of a judgment as to the rights of the parties upon the facts proved or admitted in the case. By another act, Mar. 3, 1863, two additional judges were to be appointed by the president, and a chief-justice from the whole number of judges (five). The court was also authorized to take jurisdiction of all set-offs, counter-claims, claims for damages, liquidated or unliquidated, or other demands whatsoever on the part of the government against any person making claim against the government in said court. If the judgment of the court be in favor of the government, it shall be filed in the office of the clerk of the proper district or circuit court of the United States, and shall *ipso facto* become and be a judgment of such district or circuit court, and shall be enforced the same as other judgments. If the judgment be in favor of the claimant, the sum thereby

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found due to the claimant shall be paid out of any general appropriation made by law for the payment of private claims, on presentation to the secretary of the treasury of a duly certified copy of such judgment. In cases where the amount in controversy exceeds $3,000, an appeal may be taken to the supreme court of the United States at any time within 90 days after judgment. Where the judgment or decree may affect a constitutional question, or furnish a precedent affecting a class of cases, the United States may take an appeal without regard to the amount in controversy. Claims must be filed within six years after the claim accrues, except in cases of disability. The court is required to hold one session annually, commencing on the first Monday in Oct. Members of congress are prohibited from practicing in the court. At the instance of the solicitor of the United States, any claimant may be required to testify on oath. The jurisdiction of the court is not to extend to any claim growing out of any treaty with foreign nations or Indian tribes, unless such claim was pending in said court Dec. 1, 1862; nor shall the jurisdiction of the court extend to any claim against the United States for the destruction, appropriation, or damage of any property by the army or navy engaged in the suppression of the civil war, from the commencement to the close thereof. Proceedings originate in the court by petition filed; and testimony used in the hearing and determination of claims is taken by commissioners who are appointed for the purpose by the court.

CLAIR, St., the name of a river and of a lake in North America. The river is that part of the St. Lawrence, in its largest sense, which carries into lake St. Clair the waters of lake Huron. It is 40 m. long, and half a mile broad, and easily navigable, its depth being 50 feet. Lake St. Clair measures 30 m. in length by 12 in average width, and communicates at its s.w. end with lake Erie by means of the Detroit.

CLAIRAC, a t. of France, in the department of Lot-et-Garonne, situated on the Lot, about 16 m. n.w. of Agen. It has a considerable trade in white wines. C. is chiefly interesting, however, as the first place in the s. of France that embraced the doctrines of the reformation, which it did in 1527, on the example of its abbot, Gerard Rouselle. It was the scene of frequent contests between Roman Catholics and Huguenots. Pop. '91, 3562.

CLAIRAUT, Alexis Claude, an eminent French mathematician, was b. at Paris, May 7, 1713. He early exhibited a most remarkable aptitude for mathematics, and was considered worthy of admission to the academy of sciences, while as yet he was only 18 years of age. C. wrote a great number of scientific papers, but his fame now rests principally upon his *Figure of the Earth*, in which he promulgated the theorem, that the variation of gravity on the surface of the earth, regarded as an elliptic spheroid, was altogether independent of the law of density, the opposite opinion having been previously held; on his explanation of the motion of the lunar apogee, a point left unexplained by Newton; and on his computation of the time of the return of Halley's comet. He died at Paris, May 17, 1765.

CLAIRE, St., or *Santa Clara*, was b. in 1193, of a rich and noble family of Assisi, in the duchy of Spoletto. Attracted by the eloquence and piety of St. Francis of Assisi, she abandoned the pleasures of social life, in which she had previously indulged, and betook herself to solitude, prayer, and mystic meditation. Her imagination, excited by religious emotions, deceived her into the belief that she was in more direct communication with God than her fellow-mortals; and taking her own desires for divine intimations, she foundod an order of nuns in 1212, and after obtaining a great reputation for sanctity, died at Assisi, Aug. 11, 1253. Two years afterwards, she was canonized by Alexander IV.

CLAIRE, St., Nuns of the Order of, a religious order founded by St. Claire, with the counsel and help of St. Francis of Assisi, in 1212. At first, the nuns observed the rule of St. Benedict, but in 1224 the austerity of this rule was mitigated by St. Francis, and again modified by Urban IV. in 1264. Those who follow the rule as modified by Urban, are called *Urbanists;* the other and austerer portion of the sisterhood, *Damianists*. The order rapidly increased; and convents are numerous to the present day in Italy, France, Belgium, Bavaria, Asia, and America. The nuns devote themselves chiefly to the education of the young.

CLAIRVAUX, a village in the department of Aube, about 10 m. above Bar-sur-Aube, on the left bank of the river, is remarkable as the site of the once famous Cistercian abbey (Clara Vallis), founded in 1114 by St. Bernard, who presided over it till his death in 1153, when he was buried in the church. Besides the original buildings, a new and splendid convent was afterwards erected, and a church which was reckoned a masterpiece of architecture, but was destroyed at the restoration. There was shown in the convent a monster cask, called "St. Bernard," which contained 800 tuns. The abbey, which had at one time a revenue of 120,000 livres, was suppressed at the revolution, and the extensive buildings are now used as a workhouse and house of correction.

CLAIRVOYANCE. See Somnambulism.

CLAIRVOY'ANCE, as explained by Mr. Hudson Tuttle—whose language is here in part adopted, but with some decided modifications—"must be regarded as a peculiar

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state of the mind, in which it is in a greater or less degree independent of the physical body. It presents many gradations from semi-consciousness to profound and death-like trance. However induced, the attending phenomena are similar. The condition of the physical body is that of the deepest sleep. A flame may be applied to it without producing a quiver of the nerves; the most pungent substances have no effect on the nostrils; pins or needles thrust into the most sensitive parts give no pain; surgical operations may be made without sensation. Hearing, tasting, smelling, feeling, as well as seeing, are seemingly independent of the physical organs. The muscular system is either relaxed or rigid; the circulation impeded in cases until the pulse becomes imperceptible; and respiration leaves no stain on a mirror held over the nostrils. In passing into the clairvoyant state the extremities become cold, the brain congested, the vital powers sink, a dreamy unconsciousness steals over the faculties. There is a sensation of sinking or floating. After a time the perceptions become intensified; we cannot say the senses, for they are of the body, which for the time is insensible. The mind sees without physical organs of vision, hears without organs of hearing, and feeling becomes a refined consciousness" which brings it *en rapport* with some intelligence not its own. "The more death-like the condition of the body, the more lucid the perceptions of spirit or mind, which for the time owes it no fealty." So far as clairvoyance depends on the unfolding of the spirit's perceptions, the extent of that unfolding marks the perfectness of the state, and the nature of that to which the spirit's perceptions are unfolded marks the value of the state. As a mere natural condition the state may be conceived of as the same, whether observed in "the Pythia or Delphic oracles, the vision of St. John, the trance of Mohammed, the epidemic catalepsy of religious revivals, or the illumination of Swedenborg or Davis." In all cases, there may be the same general mode of disclosure; but temperament, education, and character give such bias and color as to deprive the mere natural state of all claim to infallibility in teaching, and commonly of all value. A divine illumination, or any degree of value, can be proved in any particular case of clairvoyance, only by evidences aside from the mere state itself. The tendency of the clairvoyant is to make objective the subjective ideas which he has acquired by education or fixed by character; "if a Christian, to see visions of Christ; if a Moslem, of Mohammed; somewhat as dreams reflect the ideas of wakefulness." Yet there is claimed to be "a profound condition which sets all these aside, in which the mind appears to be divested of all physical trammels, and to come in direct contact with the thought-atmosphere of the world—a condition in which time and space have no existence, and matter becomes transparent." It may be found difficult to prove or disprove the last assertion, as it is not evident what is intended by the "thought-atmosphere of the world." By whatever name called, this condition of clairvoyance or trance has been observed among many peoples and nations from the earliest times. How near or remote it has been from the prophetic power, or from the epidemic frenzy of religious or fanatical excitement, from mental ecstasy or epilepsy, it is not our province to determine. Theories, opinions, and judgments upon the causes, conditions, and results of clairvoyance are almost as various as the number of those who have studied its phenomena. The Latin author Apuleius, who wrote in the 2d c. A.D., in his *Discourse on Magic* very clearly refers to the practice of mesmerism or clairvoyance. He says: "And I am further of the opinion that the human mind may be lulled to sleep and so estranged from the body as to become oblivious of the present, being either summoned away from it by the agency of charms, or else enticed by the allurements of sweet odors; and that so all remembrance of what is done in the body having been banished for a time, it may be restored and brought back to its original nature, which no doubt is divine and immortal, and thus, being in a kind of trance, as it were, may presage future events."

CLALLAM, a co. situated in the n.w. section of Washington, lying along the strait of Juan de Fuca and the Pacific ocean; 1824 sq.m.; pop. '90, 2771, besides Indians. The soil is fertile; chief business, agriculture. Co. seat, Port Angeles. In the co. and elsewhere in the region are the remnants of a tribe of Indians known as the Clallams, but calling themselves Nuskliyum. In 1880, they numbered about 200, but were rapidly diminishing. Their language is a dialect of the Selish.

CLAM. See CHAMA.

CLAM, in heraldry, is a term for an escalop or cockleshell, and is supposed to indicate that the bearer has been a crusader, or has made long voyages by sea.

CLAMPING-SCREW. A tool used by carpenters and joiners for holding work on a table, or for securing two or more pieces together. Two sorts are generally found: one of two straight bars of wood, each with a screw passing through, the screw-end pressing against the opposite bar; a second, a device shaped like the letter G, through the upper end of which the screw passes, and holds between its point and the lower end, the portions to be clamped, generally for gluing together.

CLAN (Gael. *clann*, Manx *cloan*, meaning "children," i.e., descendants of a common ancestor). This word became incorporated with the English language at least as early as the 17th c., to mean a body of men confederated together by common ancestry or any other tie, and in this sense it is used both by Milton and Dryden. It came to be applied almost exclusively to the several communities of the Scottish highlanders, as

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divided from each other topographically and by distinctive surnames. The word has sometimes been applied to those great Irish septs which at one time were a sort of separate states; but these, with their characteristic forms of internal government, were completely broken down by the power of the English predominance, before the word came into familiar use in the English language. In Scotland it was used in the 16th c. to designate the freebooters of the border as well as the Celtic tribes of the highlands; and there were two characteristics common to both—their predatory habits, and their distribution into communities, each with a common surname. In the act of the Scottish parliament of 1587, for instance, which requires landlords to find security for the conduct of their tenants, it is provided that those "who have their lands lying in far highlands or borders, they making residence themselves in the inlands, and their tenants and inhabitants of their lands being of clans, or dependars on chieftains or the captains of the clans, whom the landlords are noways able to command, but only get their mails (or rents) of them, and no other service or obedience, shall noways be subject to this act but in manner following." Then follow provisions for enforcing the law directly on the chieftains or captains of those clans residing in territories where the owner of the soil—generally the merely nominal owner, in terms of some useless charter—had no control. It was always the policy of the old law of Scotland to require all the highland clans to have some respectable representative—a man of rank and substance, if possible—who should be security at court for their good conduct. Clans that could find no security were called "broken clans," and their members were outlaws, who might be hunted down like wild beasts. The Macgregors were a celebrated broken C., whom the law pursued for centuries with savage ingenuity. Among other inflictions their name was proscribed, and such members of the C. as endeavored to live by peaceful industry in the lowlands, adopted derivations from it; hence we have the names of Gregor, Gregory, and Gregorson or Grierson. The clans are never treated in the old Scots acts with any respect, or otherwise than as nests of thieves and cutthroats. The following passage in the act of 1581 (c. 112), which virtually authorizes any lowlander, injured by any member of a C., to take vengeance against all or any of his clansmen, contains a picturesque, though, for a legislative enactment, certainly a very highly colored account of the social condition of the highland clans in the 16th century. "The said clans of thieves for the most part are companies of wicked men, coupled in wickedness by occasion of their surnames or near dwellings together, or through keeping society in theft or receipt of theft, not subjected to the ordinar course of justice, nor to ony ane landlord that will make them answerable to the laws, but commonly dwelling on sundry men's lands against the good-will of their landlords, wherethrough true men oppressed by them can have no remeid at the hands of their masters, but for their defense are oftentimes constrained to seek redress of their skaiths of the hail clan, or such of them as they happen to apprehend. Likewise the hail clan commonly bears feud for the hurt received by any member thereof, whether by execution of laws, or order of justice, or otherwise." The highland clans are often carelessly spoken of as a feudal institution, but in reality their distinctive character cannot be better understood than by keeping in view some peculiarities which set them in complete contrast with the feudal institutions of Britain. All feudality has a relation to land, from the serf bound to the soil through the free vassal who possesses it, up to the superior or feudal lord, who commands services out of it. The descent to all rights connected with it is hereditary. Among the highlanders, on the other hand, the relation was patriarchal, and had no connection with the land, save as the common dwelling-place of the tribe. It often happened, as the acts above quoted explain, that the head of a C. and the owner, according to feudal law, of the estates occupied by it, were two different persons. Clans did not acknowledge the purely feudal hereditary principle, and would elevate to the chiefship a brother or an uncle, in preference to the son of a deceased chief. It is a curious illustration of this, that in the rebellion of 1715, the notorious lord Lovat, who had just returned from France, being acknowledged by the C. Fraser as their chief, drew them away from the rebel army, to which the proprietor of the Fraser estates had endeavored to attach them, and arrayed them on the government side.

CLAN MACDUFF', LAW OF, was a privilege of immunity for homicide anciently enjoyed by those who could claim kindred with Macduff, earl of Fife, within the ninth degree. Macduff's Cross stood on the march or boundary between Fife and Strathearn, above Newburgh; and any homicide possessed of the right of clanship who could reach it, and who gave nine kye (cows) and a colpindash (or young cow), was free of the slaughter committed by him.

CLANDESTINE MARRIAGE. A marriage contracted without the due observance of ecclesiastical ceremonies, even where concealment was not the chief or only object of the parties, is generally called a clandestine marriage. But, in Scotland, a distinction is made between marriages which are clandestine, and those which are simply irregular. All marriages which are not celebrated by a clergyman after proclamation of bans are irregular, and such of these irregular marriages as are entered into before a person professing to act as a religious celebrator, without being a minister of religion, are clandestine, and expose the parties, the celebrator, and witnesses to certain penalties.

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These penalties may be recovered before justices of the peace, on complaint by the fiscal; and the proceeding is not without some advantage to the parties, as the conviction is received as evidence of the marriage. In the eye of the law, clandestine and irregular marriages in Scotland are as valid as those in the face of the church, provided they be of such a kind as to establish the consent of the parties to become man and wife in point of fact. But, notwithstanding the existence of this rule of the civil law, marriages in Scotland, in any other form than *in facie ecclesiæ*, are practically of very rare occurrence. Persons convicted before a magistrate of an irregular marriage are required to register such marriage, and the magistrate is bound to give notice of the conviction to the registrar; and if the irregular marriage is established in a competent court, the clerk of the court is given notice (17 and 18 Vict. c. 80). To put a stop to Englishmen crossing the border, merely in order to celebrate irregular marriages, it was enacted by 19 and 20 Vict. c. 96, "that after the 31st Dec. 1856, no irregular marriage shall be valid in Scotland, unless one of the parties has lived in Scotland for the 21 days next preceding the marriage, or has his or her usual residence there at the time." It is further enacted, that the parties to such a marriage may apply within three months, *jointly*, to the sheriff or sheriff-substitute of the county, for a warrant to register it. Upon proof that one of them had lived for 21 days, or usually resided in Scotland, and that they have contracted marriage, the sheriff is to grant a warrant to the registrar of the parish to record the marriage. A certified copy of the entry, signed by the registrar, which he must give for 5s., is declared to be evidence of a valid marriage.

CLANDESTINE MORTGAGE. This term is not used in the U. S. A second mortgage of lands for a valuable consideration, if made without notice to the mortgagee of the first mortgage, will take precedence over the first; but notice may be constructive as well as actual, and a constructive notice is presumed wherever the first mortgage has been properly recorded in the office designated by law for that purpose.

CLAP, ROGER, 1609–91; a native of Devonshire, England; one of the founders of Dorchester, Mass. He held several prominent positions, but is known chiefly by his memoirs of leading men of New England.

CLAP, THOMAS, 1703–67; a minister settled at Windham, Conn., in 1727, and in 1739 elected president of Yale college, holding the chair for 27 years, and doing great service to the institution. Through his efforts a college building and chapel were erected. He published a history of the college, and intended to write a history of Connecticut, but his materials were lost or carried away during the raid upon New Haven by the British under Gen. Tryon.

CLAPARÈDE, JEAN LOUIS RENÉ ANTOINE ÉDOUARD, 1832–70; a Swiss naturalist, who studied medicine and natural science at Berlin. He devoted himself especially to the study of echinoderms, infusoria, and rhizopods, in which he was joint laborer with J. Müller, Ehrenberg, and Lachmann. In 1857, he became professor of comparative anatomy in the Geneva academy, and subsequently visited England and the Hebrides. For the benefit of his health, he resided for some time in Naples, where he published an important work on the annelidæ of the gulf. He bequeathed his library to Geneva, his native city.

CLAP-NET, a kind of ground-net much used by the bird-catchers of the s. of England, who supply the London market. It consists of two equal parts or sides, each about twelve yards long, by two yards and a half wide, and each having a slight frame. These are placed parallel to one another, fully four yards apart, and by an ingenious contrivance, the pulling of a string is made to close them upon one another, so as to cover the oblong space between them. Call-birds, either in small cages, or fixed by braces, are placed about the net to decoy wild birds to the spot.

CLAPP, THEODORE, 1792–1866; a native of Massachusetts, graduated at Yale in 1814, studied theology at Andover, and in 1822, became pastor of the first Presbyterian church in New Orleans. In 1834, he became a Unitarian, and organized a church which included a large portion of his Presbyterian charge. He was highly esteemed for his faithfulness to duty in seasons of yellow fever, having labored unceasingly through 20 of these epidemics. His only published work is *Autobiographical Sketches and Recollections.*

CLAPPERTON, HUGH, one of those British travelers that led the way in exploring the interior of Africa, was b. at Annan, in the co. of Dumfries, Scotland, in 1788. At the age of 17, he went to sea; and being impressed into a man-of-war, he distinguished himself by his services, and was appointed to the rank of lieutenant. In 1817, he returned to England on half-pay. Having become acquainted in Edinburgh with Dr. Oudney, who was about to proceed to Bornu as British consul, the thoughts of C. were directed to Africa; and government appointed him and lieut. Denham to accompany Oudney in an exploring expedition into the interior of that continent. After a short stay at Tripoli, they started in Feb., 1822, for Bornu, where Denham separated from his companions, in order to carry his researches southward. C. proceeded westward, accompanied by Oudney, who died by the way. He still pushed on alone as far as Sakkatu, but not being allowed to proceed further westward, he retraced his steps, and, in company with Denham, returned to England in 1825. The journey had done much for the knowledge

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of Africa, but the great geographical problem of the course of the Niger was still much in the same position. To solve it, if possible, C.—the rank of commander having been conferred upon him—started again in Aug., 1825, in company with Capt. Pearce, R.N., Mr. Dickson, and Dr. Morrison. He had also Richard Lander as his confidential servant. They commenced their exploration into the interior from the bight of Benin. His companions died early on the journey, but C. and his faithful attendant, Lander, reached Sakkatu. Detained here by the sultan, Bello, the vexation joined to the hardships of the journey so affected his health, that he died at Changary, near Sakkatu, April 13, 1827. C. was the first European that penetrated from the Bight of Benin into the interior of Africa, and followed the course of the Niger for a great way. Though without scientific education, he was an intelligent and unprejudiced observer, and made important additions to geographical knowledge.—*Narrative of Travels and Discoveries in Northern and Central Africa in the years* 1822–23–24, *by Denham, Clapperton, and Oudney* (Lond. 1826); *Journal of a Second Expedition into the Interior of Africa, etc.* (Lond. 1829); *Records of Clapperton's Last Expedition to Africa*, by Richard Lander (Lond. 1830).

CLAQUE (from Fr. *claquer*, "to clap the hands," or "applaud") is the name given to a contrivance for securing the success of a public performance or production, by bestowing upon it preconcerted applause, and thus giving the public, who are not in the secret, a false notion of the impression it has made. This artifice first came into operation in theaters and concert-rooms, and arose from friendly or party motives; but it is to be feared that it has spread into other departments of public life, not excepting even parliaments.

It was in Paris that it was first regularly organized and turned into a trade. One Sauton, in 1820, established an office for the insurance of dramatic success (Assurance des Succès Dramatiques), and was thus the organizer of the Parisian "claque." The directors or managers of a theater send an order to the office for whatever number of "claqers" they think necessary. If the success of a piece seems doubtful, as many sometimes as from 300 to 500 of these people are furnished with gratis tickets, and are often instructed at the rehearsals at what particular places they are specially to applaud. How minutely the art is organized, may be seen from the exact division of functions among the several claquers. The "commissar" is bound to learn the play by heart, and call the attention of the audience about him to the various beauties of the piece; the "rieur" must laugh at every jest; the "pleureur" (weeper) has to manifest his sensibility at the moving passages. This last part is generally assigned to women, in whom the frequent use of the handkerchief seems most natural. The "chatouilleur" (tickler), on the other hand, endeavors, by distributing bonbons, snuff, theater-bills, etc., and by lively conversation, to keep his neighbors in good-humor; and lastly, the "bisseur" calls *encore!* with the utmost enthusiasm, at the conclusion of the specified pieces of music.

The following incident, which found its way into the newspapers on the occasion of the death of the famous French actress, Mademoiselle Rachel, shows the ludicrous seriousness with which the members of the C. view their singular profession: Mademoiselle Rachel had just created a new character in a modern piece, and during the first evening, was loudly applauded. The next, however, she thought her reception by no means so warm, and she complained of it, adding that the C. did not do its duty. It turned out that the head of the C. had been ill, and that his place that evening had been supplied by a *confrère* from another theater. This individual, on hearing of the complaint that had been made, wrote to mademoiselle as follows: "MADEMOISELLE—I cannot remain under the obloquy of a reproach from such lips as yours! The following is an authentic statement of what really took place: At the first representation, I led the attack in person not less than 33 times. We had three acclamations, four hilarities, two thrilling movements, four renewals of applause, and two indefinite explosions. In fact, to such an extent did we carry our applause, that the occupants of the stalls were scandalized, and cried out, '*A la porte!*' My men were positively extenuated with fatigue, and even intimated to me that they could not again go through such an evening. Seeing such to be the case, I applied for the manuscript, and after having profoundly studied the piece, I was obliged to make up my mind for the second representation to certain curtailments in the service of my men. I, however, applied them only to MM. ——, and if the *ad interim* office I hold affords me the opportunity, I will make them ample amends. In such a situation as that which I have just depicted, I have only to request you to believe firmly in my profound admiration and respectful zeal; and I venture to entreat you to have some consideration for the difficulties which environ me."

The allegation that in London theatrical artists and managers are obliged to endeavor to insure success by means of a similar institution, is strenuously denied. Although no public offices of the kind have yet been established in Germany, the artifice is extensively practiced, to the perversion of the public judgment and the detriment of art.

CLARAC, CHARLES OTHON FRÉDÉRIC JEAN BAPTISTE, Count, 1777–1847; a native of Paris, an artist and antiquary. He superintended the excavations at Pompeii, of which he gives an account in *Fouilles faites à Pompeii.* He was for a time a member of the French embassy in Brazil, and on returning to Paris, was made keeper of the museum of antiquities in the Louvre, of which museum he published a catalogue. Others of his

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works are *Manuel de l'Histoire de l'Art chez les Anciens*, and *Musée de Sculpture Antique et Moderne.*

CLARE, a co. in central Michigan, on the head-waters of Muskegon river, reached by the Flint and Pere Marquette railroad; 580 sq.m.; pop. '90, 7558. It is mostly covered with forests. Co. seat, Harrison.

CLARE, a maritime co. in the province of Munster, Ireland, bounded n. by Galway and Galway bay; e. and s. by the Shannon, and its expansion lough Derg, separating it from Tipperary, Limerick, and Kerry; w. by the Atlantic. It lies between lat. 52° 32′ and 53° 7′ n., and long. 8° 25′ and 9° 58′ west. It is seventh in size of the Irish counties; length, 67 m.; greatest breadth, 38; average, 21; area, 1294 sq.m.—more than a half being arable, and a hundredth in wood. The surface is mostly hilly, with some mountains, bog, marsh, and rugged pasture. There is an undulating plain in the center, from n. to south. On the e., lie the Inchiquin, Slieve Baughta, and Slieve Barnagh mountains, the highest being 1758 ft., with rich pastures between. The mountains on the w. rise in Mt. Callan to 1282 feet. In the s., along the rivers, are rich loamy pastures called corcasses. The coast-line is 140 m. along the sea, and 80 along the Shannon estuary. The sea-line is high and rocky, in parts precipitous, with many isles and fantastic detached rocks. For 5 m. at Moher, the coast rises 400 ft. nearly perpendicular, and at another point 587 feet. The chief rivers are the Shannon (q.v.), and the Fergus, running s. 27 m. through the middle plain, and by an estuary 5 m. broad. The county has about 100 small lakes. Carboniferous limestone is a prevailing formation in the county. The s.w. third of the county forms part of the Munster coal-field, with beds of ironstone, and thin seams of coal and culm. C. has mines of lead, copper pyrites, and manganese; slate and flag quarries; a black marble quarry near Ennis; and many chalybeate springs. The soils are warm and friable on limestone, deep rich loam on the Shannon, and cold and wet, with bogs and much timber on the coal tracts. Part of the limestone district is flooded in winter, but affords rich pasture in the summer, when the water dries up. In some places, spring-water is very scarce, and water can only be procured from the neighboring corcasses. The climate is moist and mild, but with frequent violent gales from the Atlantic. The chief trade is in grain and provisions. Fine sheep and cattle are reared on the pastures. There are fishing interests; salmon are caught chiefly in the Shannon. Frieze and hosiery are manufactured. There are slate quarries at Miltown Malbay and Kilrush. C. is divided into 11 baronies, The chief towns are Ennis (the county town), Kilrush, Ennistymon, and Killaloe. Pop. in '41, 286,394; in '51, 212,428; in '71, 147,864; in '81, 141,457; in '91, 124,483. It returns two members to parliament, one for the eastern and one for the western division. C. has many cromlechs, raths, remains of abbeys, and old castles or towers, and several round towers, one at Kilrush being 120 ft. high. C., till the time of Elizabeth was called Thomond. An adventurer called Clare gave it its present name.

CLARE, JOHN, 1793–1864; known as the *Northamptonshire Peasant Poet*, the son of a farm laborer. He was taken from school at the age of 7, and set to watching geese and sheep; at 12 he worked on a farm, paying for such education as he could get in earnings from his meager wages. He tried to get a place in a lawyer's office, but failed; studied algebra; fell in love; became a pot-boy in a public-house; was apprenticed to a gardener; ran away; enlisted in the militia; lived among the gypsies; worked as a lime-burner, and at the age of 25 was compelled to seek parish relief. Two years after, he published *Poems Descriptive of Rural Life and Scenery*, and in the following year his *Village Minstrel and other Poems.* He became famous, was patronized and flattered, and overrun with curious visitors, fell into dangerous habits, and died a madman in a lunatic asylum. His poems, as their titles indicate, deal with rustic scenes and the incidents of village life. They are spontaneous and musical, but lack vigor. See *Life* by Cherry (1873).

CLARE COLLEGE, Cambridge, founded 1326, under the name of University hall, by Richard Badew, was burned in 1338, and rebuilt and endowed by Elizabeth, countess of Clare. Chaucer calls this college "Solere" Hall. It has a master, 8 senior, and 10 junior fellows. The 18 fellowships are open to gentlemen of the degree B. A. or a higher, without restriction as to marriage. The master is elected by the senior and junior fellows. The buildings, which are in the renaissance style, are amongst the most pleasing in the university. Richard III., pretending himself to be descended from the foundress, claimed the patronage of this hall. The chapel was built in 1535, previous to which an aisle of St. Edward's church, where the masters and fellows were anciently interred, was used for the purpose.

CLARE ISLAND, an island of Ireland, belonging to the county of Mayo, situated in the Atlantic, at the entrance of Clew bay. It has a length of 4½ m., with a breadth of 2 miles. On its n.e. extremity, there is a light-house at an elevation of 487 ft. above the sea. Lat. 53° 49′ 30″ n., long. 9° 55′ 30″ w.

CLAREMONT, a t. in Sullivan co., N. H., on the Connecticut river, and the Boston and Maine railroad; 48 m. n.w. of Concord; pop. '90, 5565. West Claremont village is 2½ m. from the Connecticut, on the Sugar river, which furnishes abundant water-power, employed in the manufacture of cotton, wool, and paper. The town contains national

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banks, Stevens high school, Fiske free library, several churches, hotels and weekly newspapers.

CLAREMONT, a mansion or country-seat, at Esher, Surrey, built by a noble family of that name. When the princess Charlotte, heiress-apparent to the crown of England, was married to prince Leopold of Saxe-Coburg, C. was assigned as their residence; and at the death of the princess, in 1817, the use of it was continued to the widower for life, along with the allowance settled on him of £50,000. The prince lived here till his election as king of Belgium, after which time he only occasionally visited it. After the revolution of Feb., 1848, he placed it at the disposal of his father-in-law, ex-king Louis Philippe, who inhabited it till his death in Aug., 1850, and whose family have since continued to reside there. C. has been to the younger line of the house of Bourbon what Frohsdorf is to the elder, and has been the scene of more than one congress of the leading Orleanists.

CLARENCE, DUKE OF, the title occasionally given to a younger male member of the British royal family. It was first held by Lionel, the second son of Edward III. Albert Victor Christian Edward (1864–92), the eldest son of the Prince of Wales, held the title in recent years.

CLARENCIEUX, the first of the two provincial kings-of-arms, in England, the second being Norroy. The jurisdiction of C. extends to all England s. of the Trent, that of Norroy comprehending the portion n. of that river. C. is named after the duke of Clarence, third son of King Edward III. It is his duty to visit his province, to survey the arms of all persons bearing coat-armor within it, to register descents and marriages, and to marshall the funerals of all persons who are not under the direction of *Garter*. He also grants arms within his province, with the approval of the earl marshal. See GARTER KING OF ARMS; HERALDS' COLLEGE; KING-AT-ARMS.

CLARENDON, a co. in e. South Carolina, bounded on the s. and w. by the Santee: 664 sq. m.; pop. '90, 23,233, includ. colored. The surface is generally even and the soil fertile, producing corn, cotton, rice, etc. Co. seat, Manning.

CLARENDON, a t. in Rutland co., Vt., on Otter creek and the Bennington and Rutland railroad, 6 m. s. of Rutland; pop. '90, 928. It contains several villages, and is much visited for its mineral springs, the waters of which are said to be useful in kidney and cutaneous diseases.

CLARENDON, CONSTITUTIONS OF, were laws made by a parliament, or rather by a general council of the nobility and prelates, held at Clarendon, a village in Wiltshire, in 1164, whereby king Henry II. checked the power of the church, and greatly narrowed the total exemption which the clergy had claimed from the jurisdiction of the secular magistrate. These famous ordinances, 16 in number, defined the limits of the patronage, as well as of the jurisdiction, of the pope in England, and provided that the crown should be entitled to interfere in the election to all vacant offices and dignities in the church. The constitutions were unanimously adopted, and Becket, the primate, reluctantly signed them, at the solicitation of his brethren. But they were at once rejected by Pope Alexander III., when sent to him for ratification, and Becket thereupon immediately retracted his consent, and imposed upon himself the severest penances for his weakness in giving it. This, and the other measures adopted by the haughty and imperious archbishop, to vindicate the independence of his order, led to the unhappy disputes between him and the monarch, which terminated in the famous tragedy at Canterbury, commonly known as the *martyrdom* of St. Thomas-à-Becket, the canonization of the saint, and the pilgrimages to his tomb, which subsequently became an institution of the Roman Catholic church. Notwithstanding the personal humiliation to which Henry submitted after Becket's death, most of the provisions of the constitutions of C. continued to be permanent gains to the civil power. A masterly and dispassionate appreciation of the constitutions of C. will be found in Dr. Pauli's *Geschichte v. England;* and in Prof. Stubbs's *Select Charters illustrative of English Constitutional History*, the text of the constitutions is given.

CLARENDON, EDWARD HYDE, Earl of, an English historian and statesman, son of a private gentleman, was b. at Dinton, Wiltshire, 18th Feb., 1608, and educated at Oxford. He studied law under his uncle, Nicholas Hyde, chief-justice of the king's bench; was a member of the long parliament, and for some time spoke and voted on the side of the popular party; but on the breaking out of the civil wars in England, he attached himself to the royal cause, and in 1642 was appointed chancellor of the exchequer, knighted, and sworn of the privy council. Accompanying prince Charles (Charles II.) to Jersey, he remained there for two years, and began his *History of the Rebellion* (London, 1702–4; continuation, with Life, 1759), and also wrote the various papers which appeared in the king's name, as answers to the manifestoes of the parliament, and which far surpassed in vigor and elegance the productions against which they were directed. In May, 1648, he went to Paris, and in Nov., 1649, was sent on an unsuccessful mission for assistance from the Spanish court. He afterwards proceeded to the Hague, where, in 1657, Charles II. appointed him high chancellor of England. At the restoration, he was confirmed in that office, and elected chancellor of the university of Oxford. In Nov., 1660, he was created baron Hyde, and in April following, viscount Cornbury, and earl of Clarendon.

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In 1668, the earl of Bristol accused him of high treason in the house of lords; and though this charge failed, public indignation was excited against him by the ill success of the war with Holland, and the sale of Dunkirk to the French. The victim also of some court intrigues, he was deprived of his offices; and he secretly withdrew to Calais, whence he sent his apology to the lords; but this writing was ordered, by both houses of parliament, to be burned by the common hangman. After living six years in exile, he died at Rouen, Dec., 1674, and was buried in Westminster abbey. His daughter, Anne Hyde, became the wife, in 1659, of the duke of York, afterwards James II., and was the mother of Anne and Mary, both queens of Great Britain.

CLARENDON, George William Frederick Villiers, Earl of, a distinguished English statesman, was b. 12th Jan., 1800. He was a descendant of Thomas Villiers, who, in 1752, married the heiress of the last lord Clarendon of the Hyde family, and was, in 1756, made baron Hyde, and in 1776, earl of Clarendon. Having studied at Cambridge, he early entered the diplomatic service, and in 1833 was appointed to the then important post of ambassador at Madrid, where he acquired great influence, which he employed in establishing the government of Spain on a constitutional basis. On the death of his uncle, the third earl, without issue, he succeeded to the title, and returned to England to take his seat in the upper house. In 1840 he was appointed keeper of the great seal. When the Whig ministry was broken up in 1841, he became an active member of the opposition; but warmly supported sir Robert Peel in his measures for the abolition of the corn-laws. Under lord John Russell's premiership, he became president of the board of trade in 1846, and the following year was appointed lord-lieutenant of Ireland. He entered upon his duties in troublous times. The insurrectionary follies of Smith O'Brien and his coadjutors might have set the whole country in a blaze, but for the prompt and decisive measures which C. adopted, and which soon restored general tranquillity. At the same time, his tact and impartiality contributed to allay and reconcile the exasperations of party. The severity of his proceedings against the Orangemen on occasion of disturbances in 1849 was made the subject of a formal accusation in the house of lords; but C. made a convincing defense, and ministers declared their complete approval of his proceedings. When the Russell cabinet resigned in 1852, C. was replaced by the earl of Eglinton; but on the formation of the Aberdeen ministry in a later part of the same year, he was entrusted with the seals of the foreign office. When lord Palmerston became premier in 1855, C. held the seals until the resignation of the ministry in 1858. He resumed them, under the same premier, in 1865; retired with his colleagues in 1866; resumed the office in 1868, and retained it till his death, 1870.

CLARENDON PRESS, a printing establishment connected with Oxford university (England), founded in 1672, and named Clarendon, because the printing-house was paid for by the profits on the sale of Lord Clarendon's *History of the Rebellion*, of which work the university has a perpetual copyright.

CLARET (Fr. *clairet*), a term originally applied to wines of a light red color, but which is now used in England as a general name for the red wines of Bordeaux (q. v.). The name as used in England is unknown in France.

CLARETIE, Jules Arnaud, French dramatic critic and author, was born in Limoges, Dec. 3, 1840. He was educated in Paris, and began his career as a lecturer and journalist. His ultra-republican views caused him trouble under Napoleon III., and in 1865 and 1868 he was forbidden to deliver public addresses. In 1872 he founded a journal called the *Corsaire*. He published many volumes of history, biography, and criticism, wrote several plays, and was administrator of the Comédie Française in 1885–93. His principal works are *Voyages d'un Parisien* (1865); *Mademoiselle Cachemire* (1867); *Vie moderne au Théâtre* (2 vols., 1869–75); *Paris Assiégé — tableaux et souvenirs* (1871); *Histoire de la Révolution de* 1870–71 (enlarged edition, 5 vols., 1875–76); *Le Roman des Soldats* (1872); *Peintres et Sculptres Contemporains* (enlarged edition, 1874); *La Vie à Paris* (1883); *Le Prince Zillah* (1884).

CLARI, Giovanni Carlo Maria, b. 1669; an Italian composer of music, pupil of Colonna, chapel-master, and author of the opera *Il Savio Delirante*. He wrote also church music, duets, and trios. He d. abt. 1745.

CLARIFICATION is the process of clearing a fluid from a turbid condition, as in the case of beer (q. v.), or in the action of gelatine in fining native wines. Natural waters containing much organic matter in mechanical suspension and in chemical solution, are clarified by the addition of a little alum, which is precipitated with the organic matter, and the water then becomes healthy and refreshing. Liquids are often clarified by straining through several layers of cloth; and the addition of cold water to hot coffee, etc., causes a deposit to be thrown down, which clears the solution. The use of the clearing nut (q. v.), for clarifying water, is general in India.

CLARINET, or Clarionet', a wind-instrument of the reed kind, invented by Joseph Christoph Denner, in Nürnberg, in 1690. Its tone is produced by a thin piece of Spanish reed nicely flattened and tied, or otherwise fixed on the mouth-piece. On the body of the instrument there are holes and keys for the fingers of the performer, by which the notes are produced. In extent, fullness, and variety of tone, the C. is the most perfect of wind-instruments. Its construction, however, does not admit of every key in music being played on the same instrument, for which reason clarinets of different pitch are used in orchestral music.

CLARION, a co. in n.w. Pennsylvania, on the Alleghany and Clarion rivers, traversed by the Pittsburg and Western railroad, 580 sq. m.; pop. '90, 36,802. Surface hilly, and

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soil fertile, producing wheat, corn, oats, rye, buckwheat, butter, wool, etc. Co. seat, Clarion.

CLARK, a co. in e. Illinois, bordering on Indiana, and bounded on the s.e. by Wabash river, intersected by the Cleveland, Cincinnati, Chicago and St. Louis and the Vandalia Line railroads; 510 sq. m.; pop. '90, 21,899. The chief business is agriculture. Co. seat, Marshall.

CLARK, a co. in s.e. Indiana, on the Ohio river, traversed by several railroads; 381 sq. m.; pop. '90, 30,259. Co. seat, Jeffersonville.

CLARK, a co. in s. Kansas, formed 1870; intersected by Cimarron river; 975 sq. m.; pop. '90, 2357. Co. seat, Ashland.

CLARK, a co. in central Kentucky, bounded by the Red and Kentucky rivers on the s.; intersected by the Chesapeake and Ohio and other railroads; 260 sq. m.; pop. '90, 15,434. Co. seat, Winchester.

CLARK, a co. in s.w. Ohio, on Mad river, traversed by the Erie, the Ohio Southern, the Pittsburg, Cincinnati, Chicago, and St. Louis, and the Cleveland, Cincinnati, Chicago and St. Louis railroads; 393 sq. m.; pop. '90, 52,277. Co. seat, Springfield.

CLARK, a co. in n.e. S. Dakota, formed 1873; surface level; 970 sq. m.; pop. 1890, 6728. Co. seat, Clark.

CLARK, a co. in Wisconsin, on the Black and Eau Claire rivers, reached by the Chicago, St. Paul, Minneapolis and Omaha railroad; 1224 sq. m.; pop. '90, 17,708. Co. seat, Neillsville.

CLARK, ABRAHAM; 1726–94; one of the signers of the declaration of American independence. He was a native of New Jersey, in which colony and state he held many important offices, representing the state in congress, and in the commercial convention of 1786.

CLARK, ALONZO, 1807–87; b. Mass.; a graduate of Williams college, and of the New York college of physicians and surgeons in 1835, in which institution he was professor of physiology and pathology, and of the practice of medicine.

CLARK, ALVAN; 1804–87; b. Mass.; the son of a farmer, and a self-taught engraver, portrait-painter, and optician. His telescopes have won high reputation and the praise of astronomers in all countries. He was the inventor of a double eye-piece, an ingenious method of measuring celestial arcs of from three to sixty seconds. In 1863, with one of his own telescopes he discovered a new star near Sirius, in honor of which the French academy of sciences awarded to him the Lalande prize. He resided in Cambridge, Mass.

CLARK, ALVAN GRAHAM, son of the preceding, was born July 10, 1832; he joined his father's firm in 1853 and has since attained a fame equal to that of the elder Clark. Among the great telescope lenses made by him are that in the Lick Observatory in California (36 inches in diameter), Naval Observatory at Washington (26 inches) and a 30-inch refractor for the observatory in Pulkowa, and the great lenses for the Yerkes telescope in Chicago. He received a medal of honor from the Russian Government, and another from the French Academy in 1862. He died June 9, 1897.

CLARK, SIR ANDREW, 1826–93, a distinguished physician, was born at Aberdeen, and educated at Aberdeen and Edinburgh. After graduating at Aberdeen in 1854, he settled in London, where he acquired a high reputation for his skill in the treatment of diseases affecting the respiratory, renal, and digestive organs. Among his patients were some of the most eminent men in the political and literary world of his time, and he will live in remembrance as the "beloved physician" of George Eliot. He is the author of important works.

CLARK, FRANCIS EDWARD, D. D., clergyman; b. Aylmer, Canada, Sept. 12, 1851; graduated at Dartmouth college, 1873, and at Andover theological seminary, 1876; and held a Congregational pastorate at Portland, Me., 1876–83, and at South Boston 1883–87. In 1881 he organized the Williston Young People's Society of Christian Endeavor in his church, and in 1887 became president of the United Society of Christian Endeavor, which sprang from it, and editor of its official organ. See CHRISTIAN ENDEAVOR, SOCIETY OF.

CLARK, GEORGE ROGERS, 1752–1818; b. Va.; military officer; was in early life a surveyor; settled in Kentucky, 1775; undertook the conquest of Illinois, 1777; captured a number of villages held by the British, French, and Indians; defended the settlements around Louisville against the Indians; and destroyed the Indian villages in the Big Miami valley.

CLARK, Sir JAMES, Bart., a distinguished physician, was born at Cullen, Banffshire, Dec., 1788. In 1826 he took up his residence in London, and on the accession of queen Victoria to the throne was appointed physician in ordinary to her majesty; and in that capacity he attended the queen on most of her journeys to Scotland and the continent. He was created a baronet in 1838. Among the most important of C.'s contributions to medical science, is his work *On the Sanative Influence of Climate*, a subject upon which he was considered a high authority; and *A Treatise on Pulmonary Consumption*, in which he showed that this destructive malady is one of the general health, depending upon mal-assimilation of the food, and to be prevented, and in certain cases arrested, by a wise regulation of food, air, and exercise. He died, 1870.

CLARK, JOHN BATES, PH.D., political economist, b. in Providence, R. I., 1847,

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educated at Brown University, Amherst College, Heidelberg and Zürich Universities, appointed Professor of Political Economy and History at Carleton College, Minn., 1877; Professor of History and Political Science in Smith College, 1881, Professor of Political Economy in Amherst College, 1892, and in Columbia University 1895. For three years, (1892–4) he was lecturer on economics in the Johns Hopkins University, and in 1893 was chosen President of the American Economic Association. He holds a leading place among recent American writers on economic theory, being especially well known as the author of an economic system, of which the principal part is the theory of the distribution of wealth. This is contained in several publications, among them, *Philosophy of Wealth* (1881); *The Modern Distributive Process; Capital and its Earnings;* and *Wages*, together with numerous articles in scientific periodicals. The theory of value, set forth in the first named of these works, contains the essential points of the theory developed by the Austrian economists; and the author's conclusions were the result of independent investigation. The same work also comprises, among other striking features, a refutation of the wages fund doctrine, and an exposition of the view that wages are paid out of product. In these points the most advanced of recent writers have accepted his views, and his works are widely quoted.

CLARK, LEWIS GAYLORD, 1810–73; for 25 years the editor of the *Knickerbocker Magazine*, a monthly publication in New York city. He was the twin brother of Willis Gaylord, who wrote the *Ollapodiana* for the *Knickerbocker*, and at the time of his death (1841) was the editor of the *Philadelphia Gazette*.

CLARK, THOMAS MARCH, D.D., LL.D., b. Mass., 1812; graduate of Yale, in 1831; studied theology at Princeton, and was licensed to preach in 1835. In 1836 he became an Episcopalian, and was made rector of Grace church, Boston. In 1843 he went to Philadelphia, but returned to Boston four years later. In 1854 he was consecrated bishop of Rhode Island. He has published *Early Discipline and Culture* and *Primary Truths of Religion*.

CLARKE, a co. in s.w. Alabama, between the Tombigbee and Alabama rivers; 1160 sq. m.; pop. '90, 22,624. The surface is uneven, and much of it is covered with pine forests. Corn and cotton are the leading productions. Co. seat, Grove Hill.

CLARKE, a co. in s.w. Arkansas, on the Washita and Little Missouri rivers, 905 sq. m.; pop. '90, 20,997. The chief productions are corn and cotton. Co. seat, Arkadelphia.

CLARKE, a co. in n.e. central Georgia, on the Oconee river and its branches, reached by several lines of railroad. The land is poor, except near the streams. Productions: wheat, corn, oats, cotton, etc. Gold, garnets, and tourmaline are found. 140 sq. m.; pop. '90, 15,186. Co. seat, Athens.

CLARKE, a co. in s.w. Iowa, traversed by the Burlington, and the Des Moines and Kansas City railroads. Drained by the e. fork of Grand, and Whitebreast, and South rivers; 432 sq. m.; pop. '90, 11,332. Surface mainly prairie, and soil good; products, wheat, corn, oats, butter, wool, etc. Co. seat, Osceola.

CLARKE, a co. in s.e. Mississippi, on the Alabama border, intersected by the Mobile and Ohio railroad; 660 sq. m.; pop. '90, 15,826. The region is hilly, and occupied chiefly by pasture lands. The crops are corn, cotton, rice, etc. Co. seat, Quitman.

CLARKE, a co. in n.e. Missouri, on the Mississippi and Des Moines rivers; 510 sq. m.; pop. '90, 15,126. The surface is uneven, chiefly of fertile prairie lands, with forests of good timber. Productions almost entirely agricultural. Co. seat, Kahoka.

CLARKE, a co. in n. Virginia, on the West Virginia border, traversed by the Norfolk and Western railroad, and intersected by the Shenandoah river, 255 sq. m.; pop. '90, 8071. It is a hilly region, with fertile soil, producing wheat, corn, wool, etc. Co. seat, Berryville.

CLARKE, a co. situated in the s.w. part of Washington, bounded s. and w. by Columbia river, which separates it from Oregon; 648 sq. m.; pop. 1890, 11,709. The soil is fertile, and agriculture is the chief business. Co. seat, Vancouver.

CLARKE, ADAM, LL. D., an eminent minister and scholar of the Wesleyan Methodists, was b. about 1762 in the north of Ireland. He studied at Kingswood, near Bristol, and at the age of twenty became a preacher or evangelist, in which capacity he obtained a great name, and seems to have exercised a most beneficial influence. Although the office of a Wesleyan pastor is very unfavorable for the development of scholarly habits, C. contrived to find time for extensive study. His first work was a *Bibliographical Dictionary*, published in 1802. His attainments in oriental literature and Biblical knowledge procured for him the degree of LL. D. from St. Andrews university. The board of commissioners on the public records selected him to edit Rymer's *Fœdera*. He also edited and abridged several other works, but the great work of his life was his edition of the Holy Scriptures in English, illustrated with a commentary and critical notes, into which were compressed all the results of his varied reading. The first volume appeared in 1810, the eighth and last in 1826. C. died Aug. 26, 1832.

CLARKE, CHARLES COWDEN, 1787–1877; b. Enfield, Middlesex, England. He was the husband of Mary Cowden Clarke, and an intimate friend of Shelley, Keats, Leigh Hunt, and Lamb. In conjunction with his wife he annotated an edition of Shakespeare and compiled *The Shakespeare Key*, 1879. He also published, *A Hundred Wonders*, 1814; *Adam the Gardener*, 1834; *Shakespeare Characters*, 1863; *Molière Characters*, 1865; etc. See *Biography* by his wife (1887).

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CLARKE, EDWARD DANIEL, known as a traveler and author, was b. at Willingdon, in Sussex, in 1769. He studied at Cambridge, and from 1790 to 1799 was employed as tutor and traveling-companion in several noblemen's families, and made the tour of Great Britain, France, Italy, Switzerland, and Germany. In 1799, he set out on an extensive tour with Mr. Cripps, a young man of fortune; they traversed Denmark, Norway, Sweden, Lapland, Finland, Russia, the country of the Don-Cossacks, Tartary, Asia Minor, Syria, Egypt, Greece, and did not return to England till 1802. In consequence of his donations to the university of Cambridge, C. received the degree of LL.D. In 1807, he began a course of lectures on mineralogy, and the university established a professorship of that science in his favor. He presented to the library of Cambridge a number of valuable marbles collected during his travels; among others, the colossal statue of the Eleusinian Ceres, on which he wrote a treatise in 1803. England is also indebted to him for the possession of the famous sarcophagus with the inscription in three languages. On this he wrote a treatise: *The Tomb of Alexander, a Dissertation on the Sarcophagus brought from Alexandria, and now in the British Museum* (Lond. 1805). His "Travels," of which the first volume was published in 1810, and the fifth in 1819, were received with extraordinary favor. An additional volume, containing his *Travels through Denmark, Sweden, Lapland, Norway, Finland, and Russia*, was published after his death (Lond. 1823). A complete edition of his travels appeared in 11 vols. (Lond. 1819–24.) C. died Mar. 9, 1822.

CLARKE, HENRY FRANCIS, b. 1820; graduated at West Point in 1843. He served in the Mexican war, and was in ten battles; at Molino del Rey he was wounded; served in commissary department in the civil war; brevetted brig.-gen.; retired, 1884; d. 1887.

CLARKE, JAMES FREEMAN, D.D., b. N. H., 1810; a graduate of Harvard, and of Cambridge divinity school; pastor of a Unitarian church in Louisville, Ky., then of the Church of the Disciples in Boston; and for many years one of the overseers of Harvard college. Besides a vast number of articles contributed to current journals and magazines, Dr. C. published *Theodore* (a translation from the German); *Campaign of* 1812; *Eleven Weeks in Europe; Christian Doctrine and Forgiveness; Service Book and Hymn Book for the Church of the Disciples; Memoirs of the Marchioness d'Ossoli; Christian Doctrine of Prayer; The Hour which Cometh and Now Is; Orthodoxy, its Truths and Errors; Steps of Belief; The Ten Great Religions; Common Sense in Religion*, etc. He d. 1888.

CLARKE, JOHN, 1609–76; an English physician, who came to Massachusetts soon after the Plymouth settlement was effected. He was one of the friends of Ann Hutchinson, and with her was driven out of the colony. Roger Williams received him, and Clarke thus became one of the founders of Rhode Island. He founded in Newport (in 1638, some say; others, 1644) a Baptist church, which some believe to be the earliest in America of that denomination. He went with Williams to England in 1651, as an agent for the colony, and there published *Ill News from New England, or a Narrative of New England Persecution*. After spending 12 years in England, he procured a second charter for Rhode Island, which secured to every person at all times the right to follow his own judgment in matters of religious concern. On his return, he resumed the care of the Newport church, and kept the pulpit until his death.

CLARKE, McDONALD, 1798–1842; known as the "mad poet." He was a native of Bath, Maine, but was for many years a conspicuous figure in New York city. His madness was never violent, nor of easy detection by strangers. It was a boundless egotism rather than lunacy. He believed himself to be a great poet, and wrote a few good lines amidst an ocean of trash. Some of his conceits were noticeable, however, and such a striking figure as this, "Night drew her mantle o'er her breast, and pinned it with a star," is easily remembered.

CLARKE, MARY VICTORIA COWDEN, b. 1809; daughter of Vincent Novello, and sister of Clara Novello, the vocalist. She was the pupil and associate of Mary Lamb, and was familiar with the literary men and women of half a century ago. At the age of 19 she was married to Charles Cowden Clarke, and soon afterwards began the great work of her life, the *Concordance to Shakespeare*. This book cost her 16 years of almost uninterrupted labor. It was published in London in 1846. She afterwards published *The Adventures of Kit Bam, Mariner; The Girlhood of Shakespeare's Heroines; The Iron Cousin; World-noted Women; Portia, and other Stories of the Early Days of Shakespeare's Heroines; My Long Life, an Autobiography* (1896), etc. D. 1898.

CLARKE, Dr. SAMUEL, an eminent philosopher and theologian, was b. at Norwich, Oct. 11, 1675, and educated at Cambridge. The system of Descartes at that time held almost universal sway; but this failing to satisfy his mind, he adopted the views of his contemporary and friend, Newton. Along with philosophy, he pursued the study of theology and philology. He was some time chaplain to the bishop of Norwich, a promoter of science; he afterwards became chaplain to queen Anne, and in 1709, rector of St. James's. By his work on the Trinity (1712), in which he denied that that doctrine was held by the early church, he brought himself into considerable trouble. The convocation of bishops, who wished to avoid controversy, contented themselves with an explanation, anything but satisfactory, and a promise from C. to be silent for the future on that subject. His views were of the kind known as *semi-Arian*. For the rest, C. was a vigorous antagonist of the freethinkers of his time; in opposition to Dodwell, he sought to demonstrate the immortality of the soul from the

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idea of an immaterial being. He died May 17, 1729. His most famous work is *Demonstration of the Being and Attributes of God* (Lond. 1705); connected with it in subject is his *Verity and Certitude of Natural and Revealed Religion* (Lond. 1705). At the instigation of the princess of Wales, who was inclined to the doctrines of Leibnitz, C. entered into a keen correspondence with that philosopher on space and time, and their relations to God, on moral freedom, etc. This correspondence was published under the title of *Collection of Papers which passed between Leibnitz and Clarke in the years* 1715 *and* 1716 (Lond. 1717). In his ethical disquisitions, he seeks to find a foundation for moral obligation in a peculiar principle, which he calls the *fitness of things*, or the relations of things established from eternity by God. He published a valuable edition of Cæsar (Lond. 1712); that of Homer (Lond. 1729–46) was completed by his son. A collected edition of his philosophical works appeared in 4 vols., Lond., 1738–42.

CLARKE, WILLIAM, 1770–1838; a native of Va., appointed by Jefferson second lieut. of artillery, and ordered to join the Rocky mountain expedition which left St. Louis in Mar., 1804. To Clarke's thorough knowledge of Indians and their habits the success of the expedition was mainly due. In 1813, he was appointed governor of Missouri, and held the office until the state organization was completed. In 1822, he was made superintendent of Indian affairs, which office he held until his death.

CLARKE'S FORK, or CLARKE'S RIVER, formed by the junction of Flathead and Bitter-root rivers, in Montana, and flowing n.w., joining the Columbia river almost exactly on the line between the United States and Canada; length, about 650 miles.

CLARKSON, THOMAS, an eminent philanthropist, the son of a clergyman, master of the free grammar school at Wisbeach, Cambridge, was b. in that town, Mar. 28, 1760. He studied at Cambridge university, and was led to become the promoter of the anti-slavery agitation in Great Britain by a Latin prize-essay which he wrote in 1785, on the question, "Is it right to make slaves of others against their will?" An English translation, on being published, had an extensive circulation, and C. resolved to devote his life to a crusade against African slavery. Associations were formed. and, besides visiting the principal towns of England, and even going to Paris, in the cause, C. published numerous essays, pamphlets, and reports on the subject. Mr. Wilberforce, M.P., whose co-operation C. had secured, took the lead in the anti-slavery agitation, and in 1787 brought the subject before parliament. On Mar. 25, 1807, the law for the suppression of the slave-trade passed the legislature, and C. subsequently wrote a *History of the Rise, Progress, and Accomplishment of the Abolition of the African Slave-trade*, 2 vols. 8vo, 1808. On the formation of the anti-slavery society, in 1823, for the abolition of slavery in the West Indies, C. became one of its leading members, and saw the object of its efforts attained in 1833. He died Sept. 26, 1846.

CLARKSVILLE, city and co. seat of Montgomery co., Tenn., at the junction of the Cumberland and Red rivers, 50 miles n.w. of Nashville, and on the Louisville and Nashville railroad. It is one of the great tobacco markets of the south, and has manufactures of iron, agricultural implements, lumber, flour, etc., and valuable iron ore deposits in the vicinity. It is the seat of the Southwestern University (Pres.), founded in 1874, and has a female academy, daily and weekly newspapers, churches, high school, and national banks. Pop. 1880, 3880; 1890, 7924.

CLARKSVILLE, a magisterial dist., Mecklenburg co., Va.; including the vill. of Clarksburg, which is on the Roanoke river, 100 m. s.w. of Richmond. Pop. '90, of the mag. dist., 4517.

CLARK UNIVERSITY, Worcester, Mass., founded by Jonas G. Clark, of that city, was incorporated in 1887 and formally opened, Oct. 2, 1889. It admits, as a rule, graduate students only, and aims to supplement the work of other collegiate institutions by offering special opportunities for research. It has several buildings situated on a tract of land comprising over eight acres, and is governed by a board of nine trustees, of Worcester. No clearly marked line exists between students and instructors. Fellows and scholars who have attained some degree of mastery in a special line of work give brief special courses, which are often attended by professors. The highest annual appointment is that of docent. President, G. Stanley Hall, PH.D., LL.D. Staff, 1897, 11; fellows, scholars, etc. 39. The publications connected with the university are, *The American Journal of Psychology*, *The Pedagogical Seminary*, and the *Mathematical Review*.

CLASSICS. The term *classici* was originally applied to those citizens of Rome that belonged to the first and most influential of the six classes into which Servius Tullius divided the population. As early as the 2d c. after Christ, it is applied figuratively by Gellius to writers of the highest rank, and this mode of designation has since been very generally adopted both in literature and art. Most nations have had at some one time a more than usual outburst of literature, and they usually style this the classical period of their literature, and its most distinguished writers their classics. But as the great productions of the writers and artists of antiquity have continued to be looked upon by moderns as models of perfection, the word C. has come to designate, in a narrower sense, the best writers of Greece and Rome, and "classical" to mean much the same as "ancient."

CLASSIFICATION, the act of forming into a class or classes; a distribution into groups, such as classes, orders, families, etc., according to relations or affinities. Arti-

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ficial C. is an arrangement based on principles adopted without reference to natural relations, or in ignorance of them. Natural C. is an exhibition of systematic order as found in nature.

CLASSIS, in the Reformed church of Holland (and thence brought to America) the name of an ecclesiastical body, corresponding to a presbytery. The C. hears appeals from the consistories, which are the official boards of local churches, and the synod hears appeals from the Classis. The C. also confirms and dissolves pastoral connections, ordains and deposes ministers, and sends delegates to the local and general synods.

CLATSOP, a co. in n.w. Oregon, on the Columbia river and the Pacific ocean; 815 sq.m.; pop. '90, 10,016. The soil is good, and timber is abundant. Co. seat, Astoria.

CLAUDE, St., a t. of France, in the department of Jura, romantically situated at the confluence of the Bienne and Tacon, 25 m. s. of Lons-le-Saulnier. The town originated in an abbey erected here in the 5th century. The abbey enjoyed extensive privileges, including a very oppressive one—viz., that a year's residence on the abbey-lands made a peasant a serf. Serfdom continued down to the revolution. St. C. has a fine cathedral, dating from the 13th and 15th centuries, and among its important industries are the making of toys and the cutting of precious stones. Pop. '91, of commune, 9,782.

CLAUDE, JEAN, 1619-87; a French Protestant preacher and controvertist, professor of theology in the Protestant college at Nîmes. He had a long controversy with Bossuet and Arnauld concerning the eucharist. On the revocation of the edict of Nantes he fled to Holland, and preached at the Hague until his death.

CLAUDE LORRAIN, whose real name was CLAUDE GELÉE, a celebrated landscape-painter, b. at Chamagne, Vosges, France, in 1600, of poor parents, whose early death left him, when a boy, in the care of a relative. About 1613 he went to Rome where at a later date, about 1619, he was employed by a landscape-painter named Agostino Tassi, in grinding colors and doing other menial services. From him he gained some knowledge of the art. He left Rome in 1625, and after traveling in Italy and paying a visit to his birthplace, was called to Nancy, but returned to Rome in 1627. He painted two pictures for the Cardinal of Bentivoglio which attracted some attention, and from the year 1634 his popularity may be dated. In that year was begun his Book of Truth, *Liber Veritatis*, a collection of small drawings, about 200 in number. It was finished in 1675. He died in Rome, November 21, 1682. His landscapes are found in the chief galleries of Italy, France, Spain, and Germany, but especially in England. Besides paintings, he left a large number of etchings of which one, called *Le Bouvier*, was regarded by Hamerton as the finest landscape-etching in existence. Among his best known landscapes are those called "Morning," "Noon," "Evening," "Twilight," the "Journey of Christ into Egypt" at Dresden, and the "Siege of La Rochelle" in the Louvre. The painting on which C. himself set the highest value is the "Villa Madama." He kept it as a study and is said to have refused to sell it even when Pope Clement IX. offered for it as much gold coin as would cover the canvas. As C.'s paintings have always commanded very high prices, many copies and imitations have been imposed on buyers. This was the case even during the artist's lifetime, and his *Liber Veritatis* was designed to prevent these frauds by giving a description of each of his paintings as well as to serve as memoranda for the artist's own use. He never married, and as he devoted his time exclusively to painting, he left numerous works which in general are well preserved.

C. was an earnest, indefatigable student of nature, and possessed great invention. No one could paint with greater beauty, brilliancy, and truth the effects of sunlight at various hours of the day, of wind or foliage, the dewy moistness of morning shadows, or the magical blending of faint and ever-fainter hues in the far horizon of an Italian sky; but it has been affirmed—especially of late—that his conception is often artificial, conventional, and positively untrue, and it must certainly be admitted that his introduction of pseudo-Greek architecture into modern scenery is in the very worst taste. His figures are, in general, such inferior accessories, that he was wont to say he made no charge for them when he sold his pictures. In his private character C. was amiable and very generous. See Mrs. Pattison (Lady Dilke), *Vie de Claude Lorrain* (Paris, 1884). See illus., RAPHAEL, ETC., vol. XII.

CLAUDET'S FOCIM'ETER, an instrument for ascertaining the coincidence or non-coincidence of the chemical and visual foci in portrait or landscape combinations of lenses. It consists of eight fans or equal segments of a circle, arranged spirally round a horizontal axis; they are white, and numbered from one to eight with black figures, and, when in use, are so placed as to be all seen together from the lens. The method usually adopted in testing a lens is to focus with great accuracy the fan numbered 4, and take a photograph of the instrument, in which, if No. 4 be the sharpest and best defined, it is a proof of the coincidence of the chemical with the visual focus; if, however, No. 3 should be sharper, the lens has been under-corrected; if No. 5, the lens has been over-corrected, in the former case, the lens must be turned more towards the ground glass, and in the latter further from the ground glass.

CLAUDIA'NUS, CLAUDIUS, a Latin poet of Alexandria, lived in the end of the 4th and beginning of the 5th century. He wrote first in Greek, which appears to have been his native tongue (though he was originally of Roman extraction); but, as Gibbon says, he "assumed in his mature age the familiar use and absolute command of the Latin language; soared above the heads of his feeble contemporaries; and placed himself, after

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an interval of 300 years, among the poets of ancient Rome." His poems brought him into such reputation that, at the request of the senate, the emperors Arcadius and Honorius erected a statue in honor of him in the forum of Trajan. The productions of C. that have come down to us, consist of two epic poems, *The Rape of Proserpine*, and the incomplete *Battle of the Giants;* besides panegyrics on Honorius, idyls, epigrams, and occasional poems. C. displays a brilliant fancy, rich coloring, with variety and distinctness in his pictures; but he is often deficient in taste and gracefulness. A good edition of his works was published by Gesner (Leip. 1759), more recently by Doullay (Paris, 1836). An English translation was executed by A. Hawkins (Lond., 2 vols., 1817).

CLAU'DIUS I., TIBERIUS, a Roman emperor, the youngest son of Nero Claudius Drusus, step-son of the emperor Augustus, was b. at Lyon 10 B.C. He was naturally sickly and infirm, and his education was neglected, or left to be cared for by women and freedmen. His supposed imbecility saved him from the cruelty of Caligula; but C., in his privacy, had made considerable progress in the study of history, and wrote in Latin and Greek several extensive works now lost. After the assassination of Caligula, C. was found by the soldiers in a corner of the palace, where, in dread, he had concealed himself. The prætorians carried him forth, proclaimed him emperor, and compelled his recognition by the senate and many citizens who had hoped to restore the republic. By his payment of the troops, who had raised him to the throne, C. gave the first example of the baneful practice which subjected Rome to a military despotism under the succeeding emperors. The first acts of his reign seemed to give promise of mild and just government, but in the year 42, when a conspiracy against his life was detected, his timidity led him to yield himself entirely to the guidance of his infamous wife, Messalina, who, in concert with the freedmen Pallas and Narcissus, practiced cruelties and extortions without restraint. C. meanwhile lived in retirement, partly occupied in studies, and expended enormous sums in building, especially in the famous Aqua Claudia (Claudian aqueduct). This great work occupied 30,000 laborers during eleven years. Abroad, the armies of C. were victorious. Mauritania was made a Roman province, the conquest of Britain was commenced, and some progress was made in Germany. After the execution of Messalina, another woman equally vicious and more cruel, Agrippina (q.v.), married the emperor, and destroyed him by poison 54 A.D., in order to secure the succession of her son Nero. After his death, C. was deified.

CLAUDIUS, MARCUS AURELIUS GOTHICUS, the second of the Roman emperors named Claudius, b. in the first half of the 3d century. He had great military ability. Decius gave him command of an army, and Valerian appointed him general on the Illyrian frontier, and ruler of the provinces of the lower Danube. When Gallienus died, he was chosen emperor, it is said at his own request.

CLAUDIUS, MATTHIAS, 1740–1815; a German poet known also by the *nom de plume* of "Asmus." He wrote for the *Wandsbecker Bote* (a weekly publication), a great number of poems which suited the popular taste and were everywhere repeated and admired. In his later years, he became devout, and gave up light verses to translate the works of St. Martin and Fenelon. His most popular song is the Rhine-wine song, still often heard at festivals in Germany.

CLAUDIUS CÆCUS, APPIUS, of the 4th c. B.C.; a Roman patrician and author. While censor he achieved some radical constitutional changes. He filled senatorial vacancies with men of low birth, and when his nominations were rejected he continued, in defiance of long established custom, to hold his office, even although his colleague had resigned. He also held on to the censorship for five years in defiance of the law which limited the term to a year and a half. In many ways, he invaded the traditional rights of the patricians and elevated the lower classes. He built a road and an aqueduct and gave them his own name, a thing before unheard of; and these public works have kept his memory down to our times. In 307, he was elected consul, but his military triumphs were unimportant. He was blind and tottering with age when Cineas, the minister of Pyrrhus, king of Epirus, visited Rome to make a treaty; but the fiery eloquence of Claudius so discouraged Cineas that he quickly gave up the work, and the Romans forgot their recent misfortunes in the patriotic appeals of the aged consul.

CLAUDIUS CRASSUS, APPIUS. See APPIUS CLAUDIUS CRASSUS

CLAUSE. See DEED.

CLAUSEL, BERTRAND, a French marshal, was b. at Mirepoix, in the department of Ariège, Dec., 1772, and entered the army at an early age. He commanded a brigade in the Italian campaign of 1799; was made a general of division of the army of the north in 1802; and distinguished himself in the campaign of 1809 against Austria. The chief field of his fame, however, was Spain, where, after the battle of Salamanca, July 22, 1812, he succeeded Marmont in the command. He conducted the very difficult retreat from Portugal with the greatest circumspection, having to sustain a succession of battles. Although he had fought for Napoleon to the last, Louis XVIII., on his first restoration, named him inspector-general of infantry. When Napoleon again landed in France in 1815, C. immediately declared for him, was made a peer, and received the command of the army of the Pyrenees. On the return of the Bourbons, he was declared a traitor, but escaped to America; was condemned to death in his absence, but was subsequently permitted to return to France; and in 1830, after the July revolution, he

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received the command of the troops in Algeria, and made a successful expedition over the Atlas range into the province of Titeri, for which he was made marshal of France. Some misunderstanding, however, soon led to his recall; but he was again appointed governor-general of Algeria in 1835. After the disasters that befell the French arms before Constantine in 1836, and which were attributed in great part to him, he returned to France and defended himself—though not quite successfully—both from the press and the tribune, against the attacks made upon him. C. died at Secourrieu (Haute Garonne), 21st April, 1842.

CLAUSEN, HENRIK NIKOLAI, b. 1793; a Danish statesman and theologian, professor of theology in the university of Copenhagen, editor of the *Periodical for Foreign Theological Literature,* and author of a number of religious works. He was president of the provincial diet in 1842–6, and two years later a member of the constituent assembly, and one of the privy council. He was also one of the signers of the Danish constitution. In 1851, he resigned from the cabinet, but retained his seat in the diet. He d. 1877.

CLAUSENBURG. See KLAUSENBURG.

CLAUSEWITZ, KARL VON, 1780–1831; a Prussian soldier and author. In 1806, he was adjutant to prince Augustus, and was captured by the French. After the restoration of peace he acted as maj.gen. of staff, and as military instructor to the crown prince of Prussia, and to prince Frederick of the Netherlands. In the Prussian army he served with distinction; and in the campaign of 1813 he was a staff officer under Blücher. He wrote the history of that campaign. In 1818, he was made maj.gen. and director of the military academy, and in 1831, chief of the general staff of Gneisenau's army on the Polish frontier. His works are good authority on military science and history.

CLAUSIUS, RUDOLPH JULIUS EMANUEL, b. 1822; in 1855, professor in the polytechnic institute of Zurich; in 1867, professor in the university of Würzburg, and in 1869, professor at Bonn. His mathematical calculations based on the dynamical theory of heat, intended to show the scientific necessity of a Creator and the possibility of miracles, have attracted much attention. He d. in 1888.

CLAUSTHAL. See KLAUSTHAL.

CLAVAGEL'LA, or CLUB-SHELL, a genus of lamellibranchiate mollusks of the same family with aspergillum (q.v.), of which fossil species were first known to naturalists, but existing species have also been discovered. These mollusks inhabit holes, which they excavate for themselves in rocks or in masses of coral, and the ordinary form of the bivalve shell is curiously modified; one valve being fixed to the inner surface of the chamber in which the animal lives, and the other free and capable of motion on its hinge within that chamber, whilst the shelly substance of the fixed valve is continued without interruption into a tube extending from the chamber outwards. The young mollusk is supposed to make its way into the rock by excavating this tube, but whether its excavations are accomplished by mere mechanical means, or by the aid of some chemical solvent, is still uncertain.—Fossil *clavagellæ* have not been found in any strata older than the supracretaceous group.

CLAVA'RIA, a genus of *fungi* of the division *hymenomycetes,* subdivision *clavati.* The spores are produced equally on all parts of the surface. The species are numerous, some of them simple and club-shaped, some branched. Some are natives of Britain. *C. botrytis,* a species common in oak and beech woods in Germany, growing on the ground among moss, grass, heath, etc., is gathered when young, and used as food, having a very agreeable sweetish taste. It ceases to be edible when it becomes old. Another German species, *C. flava,* which grows on sandy ground in fir-woods, is used in the same way. Other species appear to possess similar properties, and Liebig found them to contain the saccharine substance called mannite. *C. botrytis* is the *keulenpilz,* and *C. flava* the *ziegenbart* (goat's beard) of the Germans. See illus., MOSSES, ETC., vol. X., fig. 23.

CLAVECIN, French name for the harpsichord (q.v.).

CLAVERACK, a village in Columbia co., N. Y., on the Boston and Albany railroad, 4 m. e. of Hudson; pop. 1890, 4518. Here are the Claverack academy and Hudson River Institute, a monthly periodical, and important manufactories.

CLAVERHOUSE. See GRAHAM, JOHN.

CLAVICHORD, an instrument of the harpsichord family, and an important step in the evolution of the pianoforte. Its history, previous to the 15th century, is unknown. The clavichord was shaped like the square pianoforte, having a key-board of white and black keys, and strings of brass wire set into vibration by the action of tangents or "jacks." Its tone, though weak, was delicate, and unlike the harpsichord, or spinet, it responded to the gradations of the player's touch. The clavichord was used in Germany until the beginning of the 19th century. J. S. Bach preferred it to the pianoforte, and wrote an essay for his son, *Versuch über die wahre Art Klavier zu spielen,* for this instrument, which has been the basis of all succeeding text-books of keyed instruments. Mozart used the clavichord in composition, and Beethoven preferred it above all keyed instruments, for upon it, he said, "one could best control tone and expressive interpretation." See HARPSICHORD and SPINET.

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CLAVICLE, or COLLAR-BONE, a bone which, in conjunction with the scapula (q.v.) or blade-bone, forms the shoulder. It derives its name from the Latin word *clavis*, in consequence of its resemblance to the key used by the Romans. As reference to the figure shows, it is placed horizontally at the upper and lateral part of the thorax, immediately above the first rib, and it articulates internally with the upper border of the sternum (q.v.) or breast-bone, and externally with the acromion process (or highest point) of the scapula.

Its chief office is to keep the shoulders well separated and steady, and to afford a fulcrum by which the muscles (the deltoid and great pectoral) are enabled to give lateral movement to the arm. Accordingly, it is absent in those animals in which the movement of the fore-limbs is only backwards and forwards (in one plane) for the purpose of progression, as in the pachydermata, ruminantia, and solidungula; while it is present in all quadrumana and in those of the rodentia in which the anterior extremities are used for prehension as well as motion, as the rat, squirrel, and rabbit; and in the cheiroptera and insectivora, as the bat, mole, and hedgehog. In the mole it occurs in the form of a cube, being very short and broad, and of extreme length. In many of the carnivora (the cat, for exampie), the C. is present in the rudimentary form of a small bone suspended (like the hyoid bone in the neck) amongst muscles, and not connected either with the sternum or with the scapula. In birds, where great resistance is required to counteract the tendency of the enormous pectoral muscles to approximate the shoulders, the clavicles are large and united at an angle in the median line (just above the anterior end of the sternum) into a single bone, anatomically known as the "furculum," but popularly recognized as "the merry-thought." In this class of animals, additional, and even more efficient, support to the anterior extremity is afforded by the extension of the coracoid process of the scapula into a broad thick bone called the "coracoid bone" (q.v.), which extends to the sternum. It is unnecessary to trace the various modifications which this bone presents in reptiles and certain fishes.

In the human subject, the C. being exposed to the full force of blows or falls upon the shoulder, and not being easily dislocated (in consequence of its being well secured at both ends), is very frequently broken.

Ossification takes place in the C. earlier than in any other bone, commencing as early as the 30th day after conception, according to Beclard; and at birth it is ossified in nearly its whole extent. Mr. Humphrey (in his admirable *Treatise on the Human Skeleton*) suggests that the early ossification of this bone is a provision on the part of nature to prevent it from being fractured at birth in case of difficult labor.

Much important anatomical and physiological matter in connection with this bone will be found in Humphrey's work above cited, and in a memoir which he has recently published in the transactions of the Cambridge philosophical society; in Owen, *On the Nature of Limbs;* and in Struthers, *Osteological Memoirs, No.* 1, *The Clavicle.*

CLAVICOR'NÉS (Lat. club-horned), a great family of coleopterous insects, of the section *pentamera*, distinguished by the club-shaped termination of the antennæ, which are longer than the maxillary palpi. Most of the beetles of this family feed on animal substances, and many of them, and particularly their larvæ, find their appropriate food in substances undergoing decay. It contains many genera, divided into groups (tribes), *histeroides, silphales, dermestini*, etc. Burying beetles and the bacon beetle may be mentioned as examples of it.

CLAVIER, the German name for the pianoforte, and the prototype of the *clavichord* (q.v.). In French, *clavier* designates the key-board of an organ or pianoforte.

CLAVIGE'RO, FRANCESCO SAVERIO, a Mexican historian, was b. in Vera Cruz, 1731, and, entering the order of the Jesuits, became a teacher of rhetoric and philosophy. Sent as a missionary among the Indians in various parts of Mexico, he lived among them for 36 years, and made himself fully acquainted with the languages, traditions, and antiquities of the aboriginal tribes. On the suppression of the Jesuits in America by Spain, in 1767, C. sailed for Italy, and with others of his brethren settled in Bologna, where he founded an academy, and died in 1787. He wrote in Italian a *History of Mexico*, a comprehensive and valuable work, of which an English translation by C. Cullen was published in 1787, in 2 vols. 4to.

CLAWS, sharp hardenings of the skin at the end of appendages. The term is frequently applied to the chelæ and like structures at the end of arthropod limbs, but is best limited to the epidermic tips found at the ends of the digits in most reptiles, often on birds, but most perfect in many mammals—e.g., Carnivores, Insectivores, Edentates. It is impossible to draw a distinct line between claws and nails (q.v.).

CLAY (Ang.-Sax. *clæg;* of the same root as *clag, claggy*), a term applied, in a vague way, to those kinds of earth or soil which, when moist, have a notable degree of tenacity and plasticity. The clays are not easily distinguishable as mineral species, but they all appear to owe their origin to the decomposition of other minerals, and to consist chiefly of alumina in combination with silica and with a certain amount of water. See ALUMINA, SHALE, LOAM, PIPE-CLAY, KAOLIN, etc. Common C., when, from the large proportion of alumina which it contains, it is sufficiently plastic, is of great use for making bricks (q.v.), tiles, etc.

C. is used by sculptors and others engaged in the production of works of plastic art, as a means of adjusting the form which is to be given to their work, in the harder or

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more enduring substance of which it is ultimately to be composed. As modeling C. is apt to crack in drying, it must be kept damp by sprinkling water over it, and covering it with a wet cloth when the artist is not engaged in his work.

CLAY SOILS derive their character from the alumina which they contain in a state of mixture, as well as in chemical combination with other substances. Some soils contain as large a proportion of alumina as 40 per cent, but generally the proportion is much smaller. The feldspar which chiefly yields the alumina of clay soils contains also soda and potash, substances essential to vegetables, and which tend to render clays fertile when under cultivation. The physical characters, however, of the different varieties of clay soils arising from the varying proportions of silica, and other substances mixed with the alumina, are chiefly concerned in their relative fertility. Calcareous matter exercises a considerable influence on their powers of producing crops.

CLAY, a co. in e. Alabama, on the tributaries of the Tallapoosa and Coosa rivers; 599 sq.m.; pop '90, 15,765. It has a fertile soil. Co. seat, Ashland.

CLAY, a co. in n.e. Arkansas, formed 1873; crossed by Black River, the St. Francis river forming the eastern boundary, area, 568 sq. m.; pop. '90, 12,200. Co. seat, Corning.

CLAY, a co. in n.e. Florida, bounded on the e. by St. John's river; 634 sq. m.; pop. '90, 5154. It has a level surface; and produces corn, cotton, sweet potatoes, and molasses. Co. seat, Greencove Springs.

CLAY, a co. in s.w. Ga., bordering on Alabama; 192 sq. m.; pop. '90, 7817. The surface is level: the soil fertile, producing corn, cotton, etc. Co. seat, Fort Gaines.

CLAY, a co. in s.e. Illinois, on the Little Wabash river; 470 sq. m.; pop. '90, 16,772. Surface, prairie and forest. Co. seat, Louisville.

CLAY, a co. in s.w. Indiana, on Eel river, traversed by several railroads; 360 sq. m.; pop. '90, 30,536. It has a level surface, with beds of coal, particularly block, and iron ore. Co. seat, Brazil.

CLAY, a co. in n.w. Iowa, on the Little Sioux and its tributaries; 576 sq.m.; pop. '90, 9309. Productions agricultural. Co. seat, Spencer.

CLAY, a co. in n.e. Kansas, intersected by Republican river; 660 sq.m.; pop. '90, 16,146. Agriculture is the principal business. Co. seat, Clay Centre.

CLAY, a co. in s.e. Kentucky, on the headwaters of Kentucky river; 580 sq.m.; pop. '90, 12,447. It has a mountainous surface and fertile soil. Co. seat, Manchester.

CLAY, a co. in n.w. Minnesota, bounded on the w. by the Red River of the North; 1009 sq.m.; pop. '90, 11,517. Co. seat, Moorhead.

CLAY, a co. in n.e. Mississippi, on the Tombigbee river, formed as Colfax in 1872. 420 sq.m.; pop. 1890, 18,607. Co seat, West Point.

CLAY, a co. in n.w. Missouri, bounded on the s. by the Missouri river; 415 sq.m.; pop. 1890, 19,856. Surface uneven and soil fertile. Co. seat, Liberty.

CLAY, a co. in s.e. Nebraska, on Little and Big Blue rivers; 576 sq.m.; pop. '90, 16,310. It has an undulating surface and fertile soil. Co. seat, Clay Centre.

CLAY, a co. in s.w. North Carolina, on the Georgia border, watered by the head streams of the Hiawasse river; 160 sq.m.; pop. '90, 4197. Productions agricultural. Co. seat, Hayesville.

CLAY, a co. in s. eastern South Dakota, formed and organized in 1862; bounded on the south by the Missouri river, and drained by the Vermilion; 410 sq.m.; pop. '90, 7509. Surface undulating. Co. seat, Vermilion.

CLAY, a co. in n. Tennessee, on the Kentucky border, intersected by the Cumberland river; 260 sq.m.; Co. seat, Celina. Pop. '90, 7260.

CLAY, a co. in n.w. Texas, bordering on the Indian Territory and the Red river; 1100 sq.m. Pop. '90, 7503. Co. seat, Henrietta.

CLAY, a co. in central West Virginia, on Elk river; 325 sq.m.; pop. '90, 4659 Agriculture is the chief business. Co. seat, Clay.

CLAY, CASSIUS MARCELLUS, an American politician, was born in Madison co., Kentucky, Oct. 19, 1810, and was the son of General Green Clay, noticed below, and a relative of Henry Clay. He graduated at Yale College in 1832 and returning to Kentucky to practice law, was elected to the state legislature in 1835 and again in 1837. Removing to Lexington he was elected to the legislature in 1840, but in 1841 failed of re-election on account of his strong anti-slavery opinions. In 1845 he made speeches in the northern states in advocacy of the re-election of Henry Clay, opposed the annexation of Texas, and started, at Lexington, *The True American*, a vigorous anti slavery paper, which was suppressed by a mob, but revived by Mr. Clay, and published in Lexington, although printed in Cincinnati. He volunteered in the Mexican war, 1846, and was taken prisoner; in 1850 left the whig party and was anti-slavery candidate for governor; in 1860 supported Lincoln, and in 1861 was appointed minister to Russia: returned to the U. S. in 1862 and was made major-general of volunteers, but resigned in 1863, and was again appointed minister to Russia, where he remained until 1869. See his *Life, Writings, and Speeches* (2 vols., 1886).

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CLAY, FREDERICK, musician, was born in Paris, 1840; and died in London, 1889. He received his education under Molique and Hauptmann in Leipsic, and returning to England in 1860, wrote several operas and operettas which were successful. His works include, *Constance*, 1865; *Happy Arcadia*, 1872; *Princess Toto*, 1875; *The Golden Ring*, 1883; and the *Black Crook* with Jacobi; also music to *Twelfth Night*, songs and part-songs.

CLAY, GREEN, 1757–1826; a native of Virginia, and a pioneer in Kentucky, where he was a land surveyor in early life. While the country belonged to Virginia he represented the Kentucky district in the Virginia legislature. He was in both the Virginia and Kentucky conventions for the ratification of the federal constitution. He was for several years in the Kentucky legislature, at one time speaker of the senate. In 1813, he led a force to the relief of Gen. Harrison, who was besieged by the British at Fort Meigs; and he defended that fort successfully against the British and Indians under Gen. Proctor and the renowned Tecumseh.

CLAY, HENRY, an American statesman of great distinction, was born in April, 1777, in a neighborhood called the Slashes in Hanover County, Virginia. His father, a Baptist clergyman, in humble circumstances, died when Henry (the fifth of seven children) was only four years old; and his mother, who seems to have been a woman of exemplary character, was left with a bare competence. Marrying again a few years afterwards, her second husband secured for Henry the position of clerk in a retail shop in Richmond, but, noting the brightness and promise of the lad, used his influence in obtaining for him an appointment in the office of the clerk of the High Court of Chancery, where he remained four years. Having attracted the favorable notice of Chancellor Wythe, he became his amanuensis, and enjoyed his intimacy during the greater portion of this period, until he entered the office of Robert Brooke, at that time Attorney-General of Virginia, and after a year's study was admitted to the bar at the age of twenty. Thinking advancement not sufficiently rapid in his native state, he emigrated to Lexington, Kentucky, whither his mother and step-father had preceded him in 1792, and by his good address, cordial manners, and oratorical gifts, soon won for himself popularity and built up a lucrative practice. It was not long before he turned his attention to politics, and when, in 1799, the revision of the Kentucky constitution was undertaken, we find him taking an active and honorable part on the side of the minority, and risking his personal popularity by his advocacy of the gradual abolition of slavery. He was elected in 1803 to the state legislature, where his eloquence immediately brought him into prominence. In 1806, having been chosen to represent his state in the United States Senate, during the unexpired term of General Adair, resigned, he took from the first a conspicuous part in the public business, bringing in resolutions on a variety of topics and sitting on several committees. His first speech on the bill for a bridge across the Potomac indicates his future course as one of the most earnest advocates of the system of internal improvements, the subject of so many later speeches. Scarcely had he returned to Kentucky, when he was re-elected to the state legislature and made speaker. It was at this time that, feeling keenly the rapidly growing spirit of hostility towards England, and desiring to foster domestic manufactures, he offered the resolution that all members of the legislature should wear no clothing made in foreign countries, a proposal which Humphrey Marshall, a federalist, stigmatized as the utterance of a demagogue. Angry words were used, a challenge was sent, and in the duel that followed, both parties were slightly wounded. In the winter of 1809–10 he was again elected to the senate, and continued as the champion of protection of home manufactures. When the question of chartering the United States Bank came up, Clay was found among the most strenuous opponents of the measure, and his remarks on this occasion were used against him with great effect when, upon the revival of the matter in 1816, the alteration in his views was manifested. Elected to the House of Representatives in 1811, he was chosen speaker as soon as he appeared, and at once became the leader of the younger and more ardent members of the party who favored a war with England. He supported the bills for increasing the army and navy, and was very influential in procuring the passage of the act supplementing the President's war message. He advocated offensive measures, and in his able reply to the bitter attack of Josiah Quincy upon the rashness of the Republican war policy, spoke confidently of a peace whose terms should be dictated at Halifax or Quebec. Appointed as one of the peace commissioners to Ghent, he resigned his speakership in January, 1814, and sailed on his diplomatic mission, of which he acquitted himself honorably, notwithstanding the disappointment of his hopes with regard to the terms of peace. During his absence he was again elected to the House of Representatives, and, declining the mission to Russia, which was offered to him, he took his seat and became speaker, an office that the offer of a seat in the Cabinet did not induce him to resign. In the fifteenth Congress he was again made speaker, and in the ensuing session pleaded earnestly in behalf of the recognition of the South American republics. When in 1818 the admission of Missouri came to be discussed, he opposed the exclusion of slavery from its constitution, and was foremost in bringing about the so-called Missouri Compromise (q.v.). Declining re-election to the following Congress, he did not reappear in active politics until 1823, when he again occupied the speaker's chair, and soon afterwards became a candidate for the Presidency together with Crawford, Jackson, and Adams, but the electoral college

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failing to elect, the choice between the three who stood the highest on the list fell to the House, where Clay, who had not received the requisite number of votes, voted for Adams. Soon after the latter's inauguration Clay was appointed Secretary of State, whereupon the cry of "Bargain and corruption" arose which, though again and again denied and apparently refuted, never ceased to injure him in his political career. His presence in Mr. Adams's Cabinet was denounced by Randolph as the "combination of a Puritan with a blackleg"—language which provoked a challenge from Clay, but neither party was wounded in the duel that ensued, Randolph refusing to fire at his adversary the second time. A strong opponent of General Jackson as a candidate for the Presidency, he retired with Mr. Adams, after the latter's defeat in 1829, and was elected to the Senate in 1831, where he repeatedly spoke in favor of the "American System" of protection to home industries, and continued in his hostility to the President, with whom he contested the Presidential seat in the next campaign. In the succeeding administration his chief political acts were his introduction of the famous tariff compromise (q.v.) at the time of the threatening attitude of South Carolina towards the tariff (see NULLIFICATION); his opposition to violent measures of retaliation against the French for their spoliations on our commerce, and the introduction of a resolution recommending the acknowledgment of the independence of Texas. During Van Buren's Presideney, Clay unsuccessfully opposed the administration measure of an independent treasury system, desiring in its stead the establishment of a national bank, but after Harrison's election he procured its repeal, and led his party to victory on the bank question. After the breach between the "Tyler men" and the "Clay Whigs" became apparent to all, Clay resigned his seat in the Senate and retired to private life, but was nominated for President in the next campaign and defeated by Polk, the democratic candidate. He was again and for the last time spoken of as an aspirant for presidential honors in the convention that nominated General Taylor. When in 1849 the people of his native state proceeded to remodel their constitution, the old statesman pleading the cause that he had so ably advocated fifty years before, proposed the abolition of slavery by gradual emancipation; but Kentucky held fast to her old principles, and his eloquence was in vain. Taking his seat in the Senate in the same year, and alarmed at the fierce display of sectional feeling on the slavery question, which seemed even then to threaten an irreconcilable breach between the North and South, he interposed in the cause of peace with the series of resolutions subsequently known as the compromise of 1850 (see COMPROMISE MEASURES); and, in a stirring speech, delivered in spite of his advanced age and increasing infirmity, with all his accustomed energy and fire, appealed with great effect to the patriotism of his hearers for the restoration of harmony and the preservation of the Union—an effort which was rewarded by the triumph, for a time, at least, of his pacific policy. His last speech in the Senate was on the subject of a revision of the tariff of 1846. Unable to occupy his seat for more than a few days of the session of 1851–52, owing to his failing health, he continued to the end to manifest an interest in public affairs. The last incident of importance in his career was his interview with Kossuth, when, a short time before his death, he warned the Hungarian patriot of the futility of soliciting the interference of the United States in the internal affairs of Europe, and declared the true policy of this country in dealing with foreign nations to be that set forth by Washington in his Farewell Address. Sinking rapidly after this, he died on June 29, 1852, in the seventy-sixth year of his age. The most complete edition of his speeches and writings, containing also a biography, is that by Rev. Calvin Colton (New York, 1864); see, also, a biography by Carl Schurz (Boston, 1887).

CLAYBORNE, WILLIAM. See CLAIBORNE, WILLIAM.

CLAYMORE, (meaning "the great sword"), the Gaelic name for a kind of sword at one time much used, but not so well known at present. It had a double-edged blade, about 43 in. long by 2 in. broad; its handle was often 12 in. long, and its weight 6 or 7 lbs.

CLAYS, PIERRE JEAN, b. Belgium, 1819, marine painter; resident of Brussels; pupil of Gudin, of Paris; chevalier of the Legion of Honor. His pictures are well known in America; among them are "A Squall on the Scheldt," and "Canal in Zielande."

CLAYTON, a co. in central Georgia, on Flint river; 135 sq. m.; pop. '90, 8295, includ. colored. Productions, wheat, corn, cotton, etc. Co. seat, Jonesboro.

CLAYTON, a co. in n.e. Iowa, on the Mississippi river; 745 sq. m.; pop. '90, 26,733. The surface is chiefly fertile prairie; and water power and timber are abundant. Co. seat, Elkader.

CLAYTON, a town and village, in Jefferson co., N. Y., on the St. Lawrence river, and the Rome, Watertown, and Ogdensburg railroad, 108 m. n. of Utica; pop. '90, village, 4411. The village, 11 m. above Alexandria bay, is near the famous Thousand Islands of the St. Lawrence, and has a well known manufactory of pleasure-boats.

CLAYTON, AUGUSTINE SMITH, jurist, 1783–1839, b. at Fredericksburg, Va., graduated at the University of Georgia in 1804, and in 1819 was elected judge of the superior court. While holding that office he supported the state authorities in their occupation of the territory of the Cherokee nation, but the United States supreme court decided against the legality of the state's action. He was elected to congress in 1831, and took an active part in the opposition to the tariff, and to the United States bank.

CLAYTON, JOHN, botanist, 1686–1773, b. in England, and emigrated to Virginia when a child. A genus of plants was named *Claytonia* after him.

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CLAYTON, JOHN MIDDLETON, 1796–1856; a native of Delaware, a graduate at Yale in 1815, who became an eminent lawyer in his own state. He was for many years a member of the U. S. senate, in which he held a prominent position. In 1849, he was appointed secretary of state, in which office he was followed by Daniel Webster. In 1851, he was again sent to the senate, and was in office when he died. He was the negotiator on the part of the United States in 1850 of the treaty with England guaranteeing neutrality of interoceanic communication across Central America. This agreement was known as the Clayton-Bulwer treaty.

CLAYTON, POWELL, b. Penn., 1833; studied civil engineering; was capt. of Kansas infantry in the Union army in the civil war; commissioned brig.-gen. 1864; was gov. of Ark., 1868; elected to U. S. senate as a republican, 1871; and was appointed U. S. minister to Mexico, 1897.

CLAYTONIA, or SPRING BEAUTY, a genus of plants of the order *portulacaceæ*, an early and brilliant spring flower in the United States, and naturalized in Europe. The two species are perennials, growing from tubers in moist places.

CLAZO'MENÆ, one of the twelve cities of Ionia. It was originally built on the Hermæan gulf, westward from Smyrna; but the inhabitants having, through fear of the Persians, fled to a neighboring islet, and Alexander the Great having connected the islet with the mainland by a dike, the city subsequently extended over the peninsula thus formed. It is now called Vurla.

CLĔAN'THES, a Stoic philosopher, b. at Assos, in Troas, about 300 B.C. His poverty was such, that he had to work all night at drawing water, in order to obtain money for his support, and to pay his class-fee while attending the lectures of Zeno. For nineteen years he listened patiently to the great Stoic, and, on his death, succeeded him in his school. He died of voluntary starvation when about 80 years old. C. differed, it is said, from the other Stoics, in regarding the sun as the governing principle of the world; but none of his writings are extant except a *Hymn to Zeus*, one of the purest and noblest pieces of poetry in the Greek language. It is an admirable union of religious feeling and philosophic thought, and impresses us very strongly in favor of the author, who, from all we can learn, was a man of stern and serious character. The *Hymn to Zeus* was published in Greek and German by Claudius (Göttingen, 1786), and re-edited by Merzdorf (Leip., 1835).

CLEAR, CAPE, a headland of Clear island, the most southerly extremity of Ireland, and locally belonging to Cork county. Cape C. is elevated more than 400 ft. above the sea, and has a light-house, lat. 51° 26′ n., long. 9° 29′ w., with a bright revolving light 455 ft. above the water-level.

CLEARANCE, in the mercantile marine, is a permission from the custom-house officers, or the emigration officers, or both, for the departure of a ship from a port, denoting that all the formalities have been observed, and all dues, etc., paid. If a foreign vessel, she must also be certified by the consul of the nation to which she belongs. Hence the expression *cleared out*, in reference to the departure of a particular ship.

CLEAR'CHUS, a Spartan commander of the 5th c. B.C. After serving in the Hellespont, and at the battle of Cyzicus, he became governor of Byzantium; but during his absence the town was surrendered and he was punished by a fine; after being sent into Thrace to protect the Greek colonies he was recalled by the Ephori, but he refused to obey, and made himself master of Byzantium. Being driven thence, he visited the court of Cyrus, for whom he levied a small army of Greek mercenaries and led them in the expedition of the Ten Thousand. He was the only Greek who knew the real intentions of Cyrus, and it was not until they had proceeded too far for him to retire with safety that he made known the object for which they had been collected. He commanded a division of his countrymen in the battle of Cunaxa, and led them on their difficult return journey until, being treacherously seized by Tissaphernes, he was sent to the court of Artaxerxes, where he was put to death.

CLEAR CREEK, a co. in n. Colorado, the centre of the silver-mining region; 390 sq.m.; pop. '90, 7184. The Front Range mountains occupy a considerable part of the county. The soil in the valleys is good, and water-power is plentiful. Co. seat, Georgetown.

CLEARFIELD, a co. in w. Pennsylvania, intersected by the Susquehanna river and Clearfield creek, and reached by the Pennsylvania and the Beech Creek railroads, 1079 sq. m.; pop. '90, 69,565. The e. portion is rugged and mountainous, but in other parts there is some good land. Coal and iron are plentiful. Co. seat, Clearfield.

CLEARING-HOUSE, in banking. The business facilities afforded by bankers to their customers in collecting their bills, checks on other firms, and like obligations, early imposed the necessity for an organized form of interchange of such securities, which would at once save labor and curtail the amount of floating cash requisite to meet the settlements of the bankers if effected singly. This was first done by the clerks, when out collecting from the different banking-houses, meeting daily at the counter of one of the houses for the purpose; but about 1775, the building in Lombard street, known as the "Clearing-house," was set apart for it, under the direction of a committee delegated

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by the different firms, and the immediate management of two paid inspectors. The arrangement of the establishment may be briefly described: From time to time during the day each firm transmits to the clearing-house checks and bills which are payable by other bankers for classification, taking account of the obligations coming against their firm, so that, at the close of the day, they are the better able to make up their private books. At 4 o'clock the accounts are closed; each bank has till 4.45 to decide whether it will honor the drafts upon it; and by half-past 5 the officials are able to learn that the several houses are agreed between themselves, who has to pay money and who has to receive, and how much, by making up an account of the form subjoined. It is made up as between the particular bank receiving it and the clearing-house representing every other bank with whom the former may have had any business on the day in question:

GLYN.

Debtors.	Balance.		Balance.	Creditors.
280,000	20,000	Barclay	.....	260,000
50,000	10,000	Bosanquet	.....	40,000
110,000	.....	Commercial	10,000	120,000
115,000	5,000	Currie	.....	110,000
50,000	5,000	Fuller	.....	45,000
100,000	10,000	Hanbury	.....	90,000
110,000	.....	Hankey	5,000	115,000
280,000	.....	Jones	20,000	300,000
150,000	.....	Lubbock	10,000	160,000
200,000	.....	Masterman	15,000	215,000
50,000	.....	Olding	5,000	55,000
65,000	5,000	Spooner	.....	60,000
165,000	5,000	Union	.....	160,000
	60,000		65,000	

The comparatively small balance thus exhibited, used to be settled by each banking-house which owed money sending down to the clearing-house the amount, and paying it, not to the officials there, but to any clerk whose house claimed a balance. But now, to avoid the risk of handling such a large amount of bank-notes, it is settled by means of a species of check on the bank of England appropriated to the purpose, and called *transfer tickets*, signed by each banking-house, and certified by an inspector of the clearing-house. A white one is used when the bank has to pay a balance to the clearing-house, and a green one when it has to receive a balance from it. By this means, transactions to the amount of several millions daily are settled without the intervention of a bank-note; and the importance of the arrangement may be assumed from the fact, stated in evidence before the House of Commons, that before the connection of the London and Westminster bank with the clearing-house, they were obliged to keep in hand £150,000 in notes for negotiating their exchanges. In New York, Philadelphia, Chicago, Cincinnati, and other large cities of the United States, clearing-houses have been for several years in successful operation. Either a well-known bank or a special building is used for the purpose. The best equipped and most admirably arranged clearing-houses are those of New York and Philadelphia. The room for this business is provided with separate numbered desks for a representative of each bank, and a raised *dais* for the manager of the clearing-house. Each bank belonging to the system is represented by two clerks, one of whom takes his place at his special desk, and the other stands in front to act as messenger. Usually at 8.30 A.M., the clearing-house manager calls to order, and with the utmost regularity the business of the hour proceeds. The messenger receives from his clerk packages intended for other banks, and moving from left to right visits each desk, leaving with the entering clerk such matters as he may have for him, together with a complete list of his transactions. Should all be correct, the clerks then return to their respective banks with statements of debits or credits—which must be settled with the clearing-house on the same morning. Should any errors be discovered, the clerks are not allowed to leave the clearing-house until they have been rectified, and in some instances fines are imposed and collected from the banks represented by the offending clerk. Complete records of all business therein transacted are preserved at the clearing-house. Thus transactions which formerly required many hours, are completed in a few minutes at a great saving of expense. The amounts transferred in some of the clearing-houses represent many millions of dollars daily. The New York clearing association commenced its operations on Oct. 11, 1853, numbering as members 52 banks, representing a capital of $46,721,262.50. The number was soon reduced to 48 by the retirement and closing up of four, in consequence of their inability to meet its requirements, reducing the aggregate capital to $45,118,800. On the 1st of June, 1879, the association consisted of 59 members, including the assistant treasurer of the United States at New York. The aggregate capital of the banks of the city was $83,508,800, with a surplus of $27,264,100, a reduction of capital and surplus in less than six years of $36,934,000, caused, in the

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opinion of bankers, principally by unequal and excessive tax under both federal and state laws. The transactions of the first day, Oct. 11, 1853, amounted to $23,938,682.25. Total transactions since its organization to June 1, '79, amounted to $526,110,047,756.40, a daily average, during 25 years and 7½ months, of $67,545,262.26. The highest daily average for any one year was for that ending Oct. 1, 1869, viz., $125,088,789.91. The total transactions for that year were $38,527,347,294.42. The total transactions for the year ending June 1, 1879, were $23,307,402,934.05, a daily average of $76,167,983.44. The largest amount for any one day during the year was $122,029,347, on Jan. 27, 1879, and for any one day since the organization of the association, $206,034,920.50, on Nov. 17, 1868. This was the day after the Black Friday famous for the collapse of the gigantic "corner" in gold. The largest balance paid to the clearing-house by any bank was $4,774,039.59, on April 5, 1872. The system in use by the New York clearing-house is so perfect that, of the enormous transactions made through it, no error or difference of any kind exists in any of its records; neither has any bank belonging to the association sustained any loss in its connection by the failure of any bank or otherwise, while a member. It has proved of great service during financial emergencies, notably in aiding and sustaining the United States government at the breaking out of the civil war, and during financial panics. The clearings for the whole country in 1884 were over $47,000,000,000. In 1891 they amounted to nearly $57,000,000,000; and in 1896 to $51,977,799,114. In five successive crises, namely, in 1860, 1873, 1884, 1890 and 1893, the New York banks issued "clearing-house loan certificates" in order to avert financial disaster. The principle on which these certificates are issued is that of combining, or "pooling," the reserves of all the banks. Thus, on June 15, 1893, the Clearing-House Association permitted any member to present to the loan committee its securities, together with its obligation, and receive certificates for 75% of the par value of the securities. These certificates were accepted instead of cash in the payment of balances at the clearing-house. By this means the reserves of all the banks become a common fund and the effect has been to allay the feeling of distrust in the popular mind. The certificates draw interest from the time they are used. In 1893 the amount of loaned certificates issued by the New York clearing-house, was $41,495,000. This did not altogether prevent the suspension of cash payments, nor did it keep currency from going to a premium, but it prevented the banks from closing, and tended to put an end to the panic. The operations of N. Y. clearing house represent from 55 to 60 per cent. of the aggregate clearing of the clearing-houses of the United States, and consequently it represents in a measure the magnitude of the daily business of the country; while the fluctuations in its daily, monthly, and yearly transactions, as shown by its records, are of great value both to the merchant and financier. See, *The Report of the Comptroller of the Currency*, 1896, and Horace White's *Money and Banking*, 1896.

CLEARING-NUT, *Strychnos potatorum*, a small tree of the same genus with the nux vomica (q.v.), abundant in the forests of India, and of which the seeds are much used for clearing water. They are sold for this use in the bazaars, and travelers commonly carry some with them. These seeds being rubbed on the inside of a vessel, muddy water put into it quickly becomes clear, all impurities settling to the bottom. The tree has a deeply fissured bark, ovate, smooth, and pointed leaves; and a shining, black, pulpy fruit, with only one seed. The wood is very hard, and is used for various purposes.

CLEAR LAKE, a body of water in Lake co., Cal., 112 m. n. of San Francisco. It is about 25 m. long by 2 to 6 m. wide, and is in a picturesque region.

CLEARNESS, a quality of art which is realized by a skillful arrangement of colors, tints, and tones. Where C. is to be obtained without sacrificing depth, a knowledge of *chiaroscuro* (q.v.) becomes indispensable.

CLEAR-STORY, or CLERE-STORY. Originally this term was applied generally to the upper part of any building, which was lighted by several windows, or by a row of small windows or openings in the wall. Latterly, it came to be applied exclusively to the upper part of the central aisle of a church, in which windows were found above the roof of the side aisles. The object of the clear-story in churches appears to have been to increase the light in the nave, but the windows in our existing churches are generally so small as to effect this object very imperfectly. In many churches, the clear-story is a subsequent addition, and has often been added when the high-pitched roof, which included the side aisles in its span, gave place to a flat one covering the nave only. The walls over the arches of the nave were then raised so as to receive the clear-story windows.

CLEATS, in ship-building, are pieces of wood fastened to various parts of the vessel, and having holes or recesses for fastening ropes. There are several kinds, applied to various purposes, and bearing the names of *belaying, comb, mast, shroud, single, stop, thumb*, etc., cleats.

CLEAVAGE, or SLATY CLEAVAGE, is a condition of rocks in which they split easily into thin plates. The direction of these laminæ may be in the plane of stratification, but it much more frequently differs from it. C. is the result of an operation which is subsequent to, and entirely independent of, the original stratification of the rocks. It is impossible to determine what is the producing cause of this phenomenon. By some

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it has been considered to be due to crystalline agency, while others maintain that it arises from the pressure of mechanical forces at right angles to the planes of C., and yet others seek an explanation in a combination of these two agencies. Prof. Sedgwick, who has carefully examined the phenomena of C., has arrived at the following general results: 1. That the strike of the C. planes, when they were well developed, and passed through well-defined mountain-ridges, was nearly coincident with the strike of the beds; 2. That the dip of these planes (whether in quantity or direction) was not regulated by the dip of the beds, inasmuch as the C. planes would often remain unchanged while they passed through beds that changed their prevailing dip, or were contorted; 3. That where the features of the country or the strike of the beds was ill defined, the state of the C. became also ill defined, so as sometimes to be inclined to the strike of the beds at a considerable angle; 4. Lastly, that in all cases where the C. planes were well developed among the finer slate-rocks, they had produced a new arrangement of the minutest particles of the beds through which they pass.

C., though generally confined to clay-slate, yet occasionally occurs in lime and sandstone; but in proportion as the rocks are coarse, the C. planes become fainter and wider apart. In the fine-grained clay-slate, on the other hand, the laminæ are thin, smooth, and parallel; and as C. is always accompanied with more or less induration in the rock where it exists, clay-slate, thus altered, is of great economic value for roofing.

CLEAVELAND, a co. in s.w. North Carolina, on the South Carolina border, intersected by First Broad river, and railroads; 420 sq. m.; pop. '90, 20,394, includ. colored. The chief productions are agricultural. King's mountain is near the s.e. corner. Co. seat, Shelby.

CLEAVELAND, PARKER, LL.D., 1780–1858; a native of Massachusetts, graduated at Harvard, in 1799. In 1805, he was chosen professor of mathematics and natural philosophy, and lecturer on chemistry and mineralogy in Bowdoin college, a position which he retained until his death, although many professorships in other colleges and the presidency of his own were offered to him. His attention was devoted chiefly to mineralogy, in the interests of which he explored particularly the White mountains, and corresponded with many scientific men abroad. In the 53 years of his connection with the college he kept a meteorological journal, making three entries every day.

CLEAVERS, or GOOSE-GRASS, *Galium aparine*, a species of bedstraw (q. v.), a coarse annual, with whorls of 6 to 8 leaves, both stems and leaves rough with reflexed bristles, the fruit also hispid, and when ripe, very ready to adhere to any passer by.

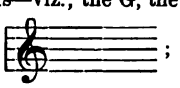
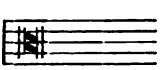
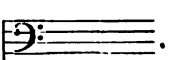
CLEBURNE, a co. in n.e. Alabama, on the Georgia border, watered by the Tallapoosa, and intersected by the Southern railroad; 545 sq. m.; pop. '90, 3218, inc. colored. Surface uneven; productions mainly agricultural. Iron and lead are found. Co. seat, Edwardsville.

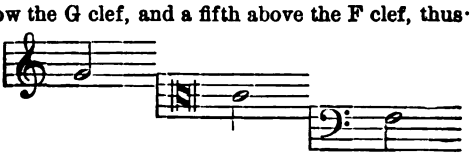
CLEBURNE, a co. in Ark.; formed 1883, from parts of Van Buren, Independence, and White cos.; area, 558 sq. m. Pop. '90, 7884. Co. seat, Heber.

CLEBURNE, town and co. seat of Johnson co., Tex., on the Gulf, Colorado and Santa Fé railroad; 18 miles s. of Fort Worth; has a large trade in grain, live stock, cotton, wool, hides, produce, groceries, dry-goods, etc.; has a cotton-compress, flour mills, churches, Irving school for young ladies, newspapers, and national banks. Pop. 1890, 3278.

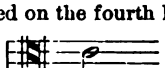
CLEBURNE, PATRICK ROMAYNE. was b. in Ireland, 1828, and enlisted in the British army; afterwards emigrated to Helena, Ark., where he studied and practised law. At the outbreak of the civil war he enlisted in the confederate service, raised a company of infantry, was made col., and rose to be lieut.-gen. He took a brilliant part in the western compaigns, especially at Chickamauga in 1863, and in 1864 on Johnston's retreat, in command of the rear-guard. He was killed at the battle of Franklin in 1864.

CLEEF, JAN VAN, 1646–1716; a Flemish painter whose works are found in many churches of Flanders and Brabant.

CLEF, a musical character placed on the staff, by which the names of the notes are fixed. There are three kinds of clefs—viz., the G, the C, and the F clef. The G clef is placed on the second line, thus:  ; the C clef on the third line, thus:  ; and the F clef on the fourth line, thus:  . The C clef is a fifth below the G clef, and a fifth above the F clef, thus:



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The C clef is also placed on the fourth line for some instruments, and for the tenor part in vocal music, thus:  ; and in old vocal music, the C clef placed on the first line was used for the soprano.

CLEG, a name given to some insects of the dipterous family *tabanidæ*, the females of which are extremely troublesome to horses, cattle, and human beings in summer, piercing their skins by means of a curious apparatus of small lancets with which the mouth is furnished, and drinking their blood. The name C. is sometimes given in England to *chrysops cœcutiens*, a fly frequent in most parts of Europe, but rare in Scotland, and which not unfrequently inserts its proboscis through the sleeve, or some other part of the dress, and thus makes man himself the object of its attack. It is about one third of an inch in length, mostly black, with yellow markings on the abdomen, and very large eyes of the most beautiful green and golden colors.

CLEISTOGAMOUS, OR CLISTOGAMOUS FLOWERS. In botany a peculiar dimorphism in the flowers of a plant arrests the development in some buds, while others expand into the ordinary flowers. These arrested buds, or cleistogamous flowers, are without petals, nectaries, or fragrance, the anthers are small, and contain but few pollen grains, and a much-reduced pistil. While not at all conspicuous, they are always fertile and produce abundance of seed, propagating themselves, when the more fertile flowers of the same plant are often nearly or quite sterile. Cleistogamy is found to exist in about sixty genera, which belong to many different orders, chiefly the dicotyledonous. The violet is a familiar instance.

CLEMANGES, NICOLAS DE, 1360–about 1425; one of the ablest Roman Catholic writers of the middle ages. He was educated in Paris, and studied theology under Pierre d'Ailly. He was chosen rector of the university of Paris in 1393, and esteemed the most eloquent member of that institution. Clemanges was an ardent advocate of reform in the church, and labored with great pertinacity to heal the schism then existing, that of a double papacy, one at Rome and one at Avignon. His doctrines were much in advance of the age in many points. He placed the authority of general councils over that of the pope, and the authority of the Bible over that of general councils. He doubted whether at all former œcumenical councils the Holy Spirit really presided, as that Spirit would not assist men in pursuing secular aims. He wrote strongly against the immoral lives of the higher clergy, and recommended the teaching of the Bible as a remedy against wars and disturbances.

CLEM'ATIS (Gr. *clēma*, the shoot of a vine), a genus of plants of the natural order *ranunculaceæ*, having four colored sepals, no corolla, and for fruit numerous one-seeded achænia with long—generally feathery—awns. The species are pretty numerous, herbs or shrubs, generally with climbing stems, natives of very different climates, and much scattered over the world. They possess more or less active caustic properties. The long awns give the plants a beautiful appearance even in winter. The flowers of many species are also beautiful. *C. vitalba*, the common TRAVELLER'S JOY (fancifully so named because of its ornamental appearance by the wayside), is the only native of Britain. It is common in the s., but becomes rarer towards the n., and is scarcely found in Scotland. The twigs are capable of being made into baskets. It rapidly covers walls or unsightly objects. The fruit and leaves are acrid and vesicant, the leaves are used as a rubefacient in rheumatism; and those of other species are also employed in the same way.—About fifty species of this genus are known to botanists, their range being from Mexico on the east to Japan on the west. Nine or ten are indigenous to North America, and of these, *C. Virginianus* or VIRGIN'S BOWER, is very widely distributed, and is common along wooded river banks and roadside walls, making a very showy appearance with its graceful sprays of white flowers. Its fertile flowers are succeeded by fruit with conspicuous feathery tails. *C. verticellaris*, with peduncles bearing large, single bluish-purple and drooping flowers, is a rare species, found in rocky mountain woods, from Maine to western New England and thence to Virginia, Wisconsin, and northwestward. *C. viorna*, popularly called LEATHER FLOWER, has very thick purplish sepals, ovate or oblong leaflets, fruit with very plumose tails, and grows in rich soils in the middle and southern states. *C. Pitcheri*, a species found along the Mississippi from Illinois southward, has a bell-shaped calyx, dull purplish sepals and noticeably reticulated leaves. *C. ochroleuca*, a rare species, found in Long Island, Pennsylvania, and New Jersey, has simple and entire leaves, silky beneath, and fruit with very plumose tails. Among the many species seen in our gardens are *C. viticella*, with its solitary, bell-shaped blossoms, and *C. florida* and *C. patens*, with large blue and purple flowers, natives of Japan. One of the most pleasing, an evergreen, with large white flowers, is *C. indivisa*, a native of New Zealand. Some species, as *C. flammula*, found in southern Europe and in the mountainous parts of northern Africa. The colors of the blossoms in this genus vary from pure white to yellow, deep purple, and ruby or scarlet. Some species are propagated by young cuttings, or by layers, others by grafting the young shoots in spring on the roots of common species, or they may be raised from seed in any light soil. Several Siberian and Alpine species, and one American, *C. verticellaris*, were grouped by Linnæus under a separate genus, *Atragene*.

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CLÉMENCEAU, BENJAMIN GEORGE EUGENE; born Moulleron-en-Pareds, Vendée, 1841; French physician and politician; graduated at Paris, 1869; was elected mayor of the eighteenth arrondissement of Paris, after the revolution of 1870. He was also a member of the commission of education; and was elected, 1871, representative to the national assembly, in which body he has always acted with the extreme Left. Since his election to the assembly he has become one of the most prominent of French politicians. He presented a bill to authorize the election of a municipal council for Paris, to consist of 80 members; was defeated at the municipal elections, 1871; and resigned as mayor and deputy, the same year. In 1875, he was elected a member of the municipal council of Paris, of which he eventually became the chairman He was sec. of the chamber of deputies, 1876; and has repeatedly been elected to the national assembly. In 1871, he fought a political duel with de Poussargues, in which the latter was wounded. As the leader of the advanced Left, his opposition to the Tonquin policy decided the fall of M. Ferry, and he supported M. de Freycinet with enthusiasm. During the last years of Gambetta's life he was his bitter adversary. In 1885 he was elected one of the deputies of Paris, but lost his seat by the Panama scandal of 1892. He continued as proprietor and editor of *La Justice*, an influential radical journal.

CLEMENS, JEREMIAH, 1814–65, lawyer and politician, was born in Huntsville, Alabama, and graduated from the University of Alabama in 1833. He was admitted to the bar in 1834; was elected to the state legislature several terms, and distinguished himself in the Mexican war. He was U. S. senator, 1849–53, and was considered a most able speaker; was presidential elector in '56; during the civil war he accepted office under the Confederacy, though he never favored secession, and in 1864 advocated the re-election of Lincoln. He was the author of several novels, among them being *The Rivals, a Tale of the Times of Aaron Burr and Alexander Hamilton* ('59); *Tobias Wilson, a Tale of the Great Rebellion* ('65).

CLEMENS, SAMUEL LANGHORNE, M.A. (Mark Twain), American humorist, was born in Florida, Monroe co., Mo., Nov. 30, 1835. After receiving a common-school education, he was at thirteen years of age apprenticed to a printer, and subsequently worked at his trade in St. Louis, New York, and elsewhere. In 1857 he became a pilot on a Mississippi river steamboat, but in 1861 emigrated to Nevada with an older brother, who had been appointed Secretary of the territory, and was his assistant for a time; then tried mining, and in 1862 became local editor of the Virginia City *Enterprise*. In 1863, Captain Isaiah Sellers, who had furnished river news for the New Orleans *Picayune*, died, and his pen-name, "Mark Twain" (the cry of a steamboat leadsman on sounding two fathoms), was assumed by Clemens. Removing to California, in 1865, Clemens was employed as a reporter by the San Francisco *Morning Call*, but gave up the position to try his fortune in the gold diggings of Calaveras co. In 1866 he visited the Sandwich Islands, and on his return began his career as a lecturer. In 1867 he traveled in an excursion party through Europe, Egypt, and Palestine, as related in his serio-comic, *The Innocents Abroad:* from 1869 to 1871, edited the Buffalo *Express;* in 1870 was married to Miss Langdon, of Elmira, N. Y., and in Oct., 1871, settled in Hartford, Conn. In 1884 he established in New York the publishing house of C. L. Webster & Co. which published General Grant's *Personal Memoirs*, etc., and afterward involved Mr. Clemens in heavy financial losses. The humor of this writer, as described by William D. Howells, is "a sort of good-natured self-satire, in which the reader may see his own absurdities reflected." A lecturing tour in England, in 1872, secured Clemens a circle of readers which has proved as appreciative as that in his own country. His books, all of which have been sold by subscription, have been republished abroad. The principal ones are, *The Jumping Frog* (1867); *The Innocents Abroad* (1869); *Roughing It*, and *Sketches, Old and New* (1872); *The Gilded Age* (in connection with Charles Dudley Warner, and subsequently dramatized), 1873; *Adventures of Tom Sawyer* (1876); *A Tramp Abroad* (1880); *The Stolen White Elephant* (1882); *Prince and Pauper*, an historical romance (1882); *Life on the Mississippi* (1883); *The Adventures of Huckleberry Finn* (1885); a compilation, *Mark Twain's Library of American Humor* (1888); *A Connecticut Yankee at King Arthur's Court* (1890 and 1896); *The Tragedy of Pudd'nhead Wilson and the Comedy of those Extraordinary Twins* (1895); *Personal Recollections of Joan of Arc, How to tell a Story, and Other Essays* (1897), etc.

CLEM'ENS, TITUS FLAVIUS, a celebrated father of the Christian church, was born probably at Athens, and resided during the greater part of his life in Alexandria, whence the epithet *Alexandrinus*. He flourished at the close of the 2d and the beginning of the 3d century. In his earlier years, he devoted himself with great zeal to the study of philosophy. His love of knowledge induced him to visit Greece, Italy, Syria, Palestine, and other countries. It is not known at what precise period he was converted from heathenism; but it is certain that after coming to Egypt, and listening to the prelections of Pantænus, he joined the Alexandrine church, and was made presbyter. Afterwards he became assistant to his master, who held the office of *catechist*. In 202 A.D., the persecution of the Christians under Severus compelled him to flee to Palestine. He is supposed to have returned to Alexandria about 206, and in 211 succeeded Pantænus. The year of his death is differently stated; some writers think it probable he died 213 A.D.; others as late as 220. His most distinguished pupil was Origen.

C. was a very fertile writer. The chief productions of his which have survived are the *Protrepticus*, *Pædagogus*, and *Stromata*—which together form one large work. The first is an exhortation to the heathen to abandon idolatry; the second, an exposition of

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Christian ethics; and the third, a collection of treatises and brief observations on Greek and Christian literature.

CLEMENS, or CLEMENT, is the name of 17 popes, few of whom require any special notice. See POPES. CLEMENS ROMANUS, probably the C. mentioned in the Epistle to the Philippians, is assumed as the first of the series. He is accounted one of the apostolic fathers. He is said to have died as bishop of the church in Rome, in the year 102. Of his two *Epistles to the Corinthians*, the first and longest is undoubtedly genuine. But the apostolic canons and constitutions attributed to him are spurious, as well as the fabulous account of his journeys with the apostle Peter. This last has come down to us in two forms: one in Greek, divided into 19 homilies, under the title of *Clementina;* the other, a Latin translation by Rufinus, entitled *Recognitiones Clementis.* The Epistles have been edited by Muralt (Zurich, 1848), the Homilies by Schwegler (Stutt, 1847), and the Recognitiones by Gersdorf, in his *Biblioth. Patr. Eccl.*, vol. i. (Leip. 1837).

CLEMENT II. (SUIDGER), a Saxon chancellor to the emperor Henry III. of Germany, who made him pope in Dec., 1046, on the abdication of Gregory VI. He died the next year.

CLEMENT III. (PAOLO or PAULINO SCOLARI, bishop of Prænesle), elected pope 1187; d. 1191. He settled some of the troubles between the popes and the Roman people by permitting the latter to elect their magistrates, while the nomination of the governor of the city was left to the pope. He incited Philip Augustus and Henry II. of England to undertake the third crusade.

CLEMENT IV. (GUI FOULQUES, archbishop of Narbonne), chosen pope 1265; d. 1268. He had been secretary to Louis IX. of France, and when raised to the chair of St. Peter the papacy was at war with Manfred the Ghibelline usurper of Naples, and C. was compelled to enter Italy in disguise. He made an alliance with Charles of Anjou, the French pretender to the Neapolitan throne; Manfred was slain, and Charles formally established. C. is said to have disapproved of many of the harsh measures of Charles. He also encouraged and protected Roger Bacon.

CLEMENT V. (BERTRAND DE GOTH, archbishop of Bordeaux), chosen pope 1305. He removed the seat of the papacy to Avignon, and suppressed the order of templars. During his papacy, Henry VII. entered Italy, and was crowned in Rome by C.'s legate: but Henry died suddenly, leaving Italy in a condition of anarchy; the Roman barons were at the height of their dissension, and the Lateran palace was burned. C. suppressed in the bloodiest manner the heresy of Fra Dolcino, and died leaving a reputation disgraceful for nepotism, avarice, and cunning. He was the first pope to wear the triple crown. He died in 1314.

CLEMENT VI. (PIERRE ROGER, archbishop of Rouen), the fourth of the popes of Avignon, elected 1342; d. 1352. He was entirely under French influence, refused an invitation to return to Rome, and purchased the sovereignty of Avignon from Joanna, queen of Naples, agreeing to pay her 80,000 crowns. He never paid the money, but probably deemed that he had given its equivalent when he absolved the queen for the murder of her husband. He disputed with Edward III. of England concerning that monarch's encroachments upon ecclesiastical jurisdiction, excommunicated Louis of Bavaria, and made some negotiations for a reunion with the eastern church.

CLEMENT VII. (GIULIO DE MEDICI), elected pope 1523; d. 1534. His worldliness and lack of insight into the tendencies of the age disqualified him from comprehending the great religious movement which then convulsed the church, while his timidity and indecision no less disabled him from following a consistent policy in secular affairs. He was at first attached to the imperial interest, but by the overwhelming success of the emperor in the battle of Pavia was terrified into joining the other Italian princes in a league with France. But his zeal soon cooled, and by want of foresight and unreasonable economy he laid himself open to an attack from the turbulent Roman barons which obliged him to invoke the mediation of the emperor. When this danger seemed past, he veered back to his former engagements, and ended by drawing upon himself the host of the imperialist gen., the constable Bourbon, who led his army against Rome, and assaulted and sacked the city, May 5, 1527. The pope retired to the castle of San Angelo, and was there kept a prisoner for six months. He was released upon very onerous conditions, and for several years afterwards followed a policy of subserviency to the emperor, on the one hand endeavoring to induce him to act with severity against the Lutherans of Germany, and on the other striving to elude his demand for a general council. One consequence of this dependence on Charles V. was the breach with England occasioned by the pope's refusal to sanction Henry VIII.'s divorce from Catherine of Aragon.

CLEMENT VIII. (IPPOLITO ALDOBRANDINI, elected to the papacy 1592; d. 1605. He brought about the reconciliation of the church with Henry IV. of France; and to him Europe was indebted for the peace of Vervins (1598) which put an end to the long contest between France and Spain. He also annexed Ferrara to the states of the church, the last addition of importance to the pope's temporal dominion. The only severe act in Clement's career was the execution of Giordano Bruno, Feb. 17, 1600.

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CLEMENT IX. Giulio Rospigliosi, elected pope 1667; d. 1669. He adjusted the disputes between the Roman see and those prelates of the Gallican church who had refused to join in condemning the writings of Jansenius.

CLEMENT X. (Emilio Altieri), chosen pope 1670; d. 1676. He was 80 years old when elected, and in consequence of infirmity he left the government to his nephew, cardinal Altieri, whose interference with the privilege of ambassadors occasioned disputes in which the pope was obliged to yield.

CLEMENT XI. Giovanni Francesco Albani, elected pope 1700; d. 1721. The most memorable event of his rule was the publication in 1713 of the bull *Unigenitus*, which so greatly disturbed the peace of the Gallican church. By this famous document 101 propositions extracted from the works of Quesnel were condemned as heretical, and as identical with propositions already condemned in the writings of Jansenius. The resistance of many French ecclesiastics, and the refusal of French parliaments to register the bull, led to controversies extending through the greater part of the 18th century. Another important decision by this pope forbade the Jesuit missionaries to take part in idolatrous worship, or to accommodate Christian language to Pagan ideas under plea of conciliating the heathen.

CLEMENT XII. Lorenzo Corsini, 1652–1740; pope from July, 1730, to Feb., 1740. He was the first pope to condemn the order of Freemasons.

CLEMENT XIII. Carlo Rezzonico, Bishop of Padua, chosen pope 1758; d. 1769, it was suspected from poison. In his time France, Spain, and Portugal urgently demanded the suppression of the Jesuits, but Clement warmly supported them. The pressure, however, became so strong that he was supposed to be about to give way, and had convoked a consistory, when he died very suddenly, and thus the Jesuits were saved for the time.

CLEMENT XIV., Giovanni Vincenzo Antonio Ganganelli, was b. in 1705 at St. Arcangelo, near Rimini, where his father was a physician. At the age of 18, he entered the order of Minorites, and studied philosophy and theology, which he then successfully taught. His merits were appreciated by the keen-sighted Benedict XIV., who appointed him to the important post of counselor to the inquisition, and under Clement XIII. he was made a cardinal. On the death of Clement XIII., he succeeded to the papal chair, May 19, 1769. No pope had ever been elected under greater difficulties. The kings of Portugal, France, Spain, and Naples were at variance with C., chiefly on account of his support of the Jesuits; Venice wished to reform the religious orders without his interference; Poland was seeking to diminish his influence; the Romans themselves were discontented. C. first set about reconciling the monarchs; he sent a nuncio to Lisbon, suspended the bull *In Cœna Domini*, and entered into negotiations with Spain and France. After several years of negotiation, he issued, 1773, the famous brief *Dominus ac Redemptor noster*, suppressing "forever" the society of the Jesuits. The motive assigned in the brief is, "regard to the peace of the church." From this time his life was made miserable by constant fear, and his strength gradually gave way. He died of a scorbutic disease, Sept. 22, 1774. C. was remarkable for liberality of mind, address as a statesman, sound learning, and mildness of character. He cherished the arts and sciences, and was the founder of the Clementine museum, which, by the additions of Pius VI. and Pius VII., became the chief ornament of the Vatican.

CLÉMENT, Jacques, 1565–89; a monk who was selected by the leader of the league for the assassination of Henry III. The day before the murder C. fasted, partaking only of the Lord's supper. In the morning, Aug. 1, 1589, he was admitted to the palace as the bearer of a letter, and while the king was reading it he stabbed him. Henry threw the knife into the assassin's face, exclaiming "Oh; the wicked monk! he has killed me! put him to death!" He was immediately killed, and his body quartered and burned. The king died the next day, and the murderer was declared a martyr by Bourgoing and other Roman Catholic prelates.

CLEMENT of Alexandria. See Clemens, Titus Flavius.

CLEMENTI, Muzio, one of the best of pianists and composers for the pianoforte, was b. at Rome in 1750 or 1752. His skill on the pianoforte, when only 13 years of age, secured for him the notice of a Mr. Beckford, an English gentleman traveling in Italy, with whom C. went to England, and in whose family he remained for several years, studying the works of the great composers, and where he also acquired an extensive knowledge of literature. His "Opera 2" (composed in his 18th year) is considered the model on which the whole modern pianoforte sonatas have been founded. After traveling on the continent for some time, he returned to England, where he obtained the highest reputation as a teacher. Pecuniary misfortunes induced him, in the year 1800, to commence business as a music-seller and manufacturer of pianofortes. He died in London, Mar. 10, 1832. His compositions, mostly pianoforte sonatas, are full of pleasant melody, and arranged in masterly style. For students, his classical *Introduction to Pianoforte Playing*, and his last work, the *Gradus ad Parnassum*, have been highly recommended. His style of playing was brilliant, and in improvisation he excelled all his predecessors.

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CLEM'ENTINES, a collection of papal decrees and constitutions published by Pope Clement V. in 1313. They constitute five books and 52 titles in the *Corpus Juris Canonica*.

CLEOBU'LUS, one of the seven sages of Greece, the son of Evagoras, and a native of Lindus, over which town he was ruler. He was celebrated for strength and beauty of person, the wisdom of his sayings, the acuteness of his riddles, and the elegance of his lyrics. A letter of his inviting Solon to take refuge with him from Pisistratus indicates that C. was alive in 560 B.C. His son Cleobuline was quite as famous for riddles.

CLEOM'BROTUS I., a son of Pausanias, and king of Sparta in 380 B.C. He was the leader of the army on several expeditions, but without remarkable success. In 371 he went against the Thebans, but was disastrously defeated by Epaminondas. C. was mortally wounded in this battle, which took place at Leuctra.

CLEOME'DES, a Greek writer on astronomy. Nothing is known regarding his life, nor the period when he flourished. His treatise is entitled *The Circular Theory of the Heavenly Bodies*, and is remarkable as containing, amid much error and ignorance, several truths of modern science—such as the spherical shape of the earth, the revolution of the moon about its axis, its revolution round the earth, etc. C.'s treatise was first printed in Latin by Geo. Valla (Ven. 1498); in Greek, by Conrad Neobarius (Par. 1529). The two latest editions are those of Janus Bake (Lugd. Bat. 1820) and C. C. T. Schmidt (Leip. 1832).

CLEOM'ENES I., King of Sparta about 519 B.C. He led a Spartan force to Athens in 510 to aid in the expulsion of Hippias; and he was afterwards called in to support the Athenian oligarchical party led by Isagoras against the party of Clisthenes. On a technical charge of pollution, he banished 7,000 families, and established a new constitution, transferring the old senate to 300 of the oligarchical party. He was soon afterwards forced to leave the city. He made another unsuccessful attempt to sustain Isagoras. When the Ionian colonies revolted from Persia, their leader, Aristagoras, came to seek aid from Sparta, and tried to bribe Cleomenes to join him, offering higher and higher sums, until Cleomenes' daughter, Gorgo (afterwards the wife of Leonidas), eight or nine years old, said, "Father, go away, or the stranger will corrupt you." During a local war between Sparta and Argos, Cleomenes, by a stratagem, defeated the Argive forces near Tiryns. Those who escaped from the battle took refuge in a sacred grove, which Cleomenes ordered to be set on fire, and 6,000 of the flower of Argive citizens perished in the flames, a loss from which Argos was long in recovering. Another legend is that Argos was defended against Cleomenes by the women of the city. In the later years of his life C. became insane, and was kept in confinement; but he prevailed upon a slave to bring him a knife, with which he killed himself.

CLEOM'ENES III., the last king of Sparta of the Agidæ, came to the throne in 240 B.C. He desired to restore the old constitution and discipline of Lycurgus, and also to destroy the Achæan league. The league was defeated in a great battle at the foot of Mt. Lycæum. In Sparta, Cleomenes found active opponents in the ephors, but he crushed them by surrounding the hall in which they were feasting, and slaughtering them in a body. Then he established a new constitution, abolished the ephors, restoring the old prerogatives of the kings, making a re-distribution of lands, and extending the franchise. But in the war which ensued with the Achæan league he was defeated in the battle of Sellasia, 222 B.C., when the death-blow was given to the independence of Sparta. Cleomenes fled to Egypt, but came back some years later and headed an insurrection against the king. The plot failed, and Cleomenes committed suicide.

CLE'ON, a famous Athenian demagogue, who flourished during a part of the Peloponnesian war, was originally a tanner, but having a strong bias towards politics, he gradually abandoned his business, and became the champion of popular "rights." He first became prominent in the discussion regarding the fate of the Mytilenæan prisoners, 427 B.C. C. advocated the massacre of the males, carried his point, and more than 2,000 perished; the rest were saved through the remorse of the Athenians. In 425 B.C., along with Demosthenes, he commanded an expedition against the island of Sphacteria, which was garrisoned by the Lacedemonians, and, much to the surprise of every one, succeeded in reducing the place; but the whole merit of this deed is usually attributed to his colleague. C. himself, however, was highly elated with his success, and his countrymen, or, at least, many of them, appear to have fancied that he really possessed military genius, for in 422 B.C. he was sent to oppose Brasidas, the Spartan general, in Macedonia and Thrace. On his way thither, he took Torone, a town in which Brasidas had left a small garrison, and afterwards Galepsus. But the great design of the campaign was the capture of Amphipolis, where Brasidas was stationed. C. somewhat reluctantly advanced, and began to reconnoiter. While he was so doing, Brasidas made an unexpected sally, and in the battle which ensued both leaders were slain. The Athenian army, however, was defeated, and obliged to retreat. The general opinion of C. is not favorable. He is painted both by Thucydides and Aristophanes as an ignorant, vain, blustering, and cowardly *mobo-*

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crat. Most modern historians have accepted this estimate of the man; but Grote, in his *History of Greece*, has thrown very considerable doubt on its truth, and has labored to show that he was the rough but resolute champion of the people, and that his character has been vilified and abused by Aristophanes, who was—there can be no doubt—violently aristocratic.

CLEOPA'TRA, the daughter of the Egyptian king, Ptolemy Auletes, was b. 69 B.C., and, according to the will of her father, should have inherited the throne along with her brother, Ptolemy Dionysus, who was also her husband. Her claim, however, being opposed, Julius Cæsar came to Alexandria, 48 B.C., to interpose in the quarrel, and in the Alexandrian war, Ptolemy Dionysus fell, and C., who was now married to her younger brother, Ptolemy, a boy of eleven years, was established upon the throne of Egypt. She bore a son to Cæsar, who was named Cæsarion. On her visiting Rome, Cæsar received her with great magnificence, and placed her statue in the temple which he had built to Venus Genitrix. In the civil war, after Cæsar's assassination, C. at first hesitated which side to take. After the battle of Philippi, Antony summoned her to appear before him at Tarsus, in Cilicia, to give account of her conduct. C., who had in the mean time got quit of the youthful Ptolemy by poison, appeared in the character of Venus Anadyomene, and so fascinated Antony, that he ever afterwards remained devoted to her. They spent the winter, 41–40 B.C., in Alexandria, in revelry; and Antony, although he had in the mean time married Octavia, the sister of Octavianus, returned to the embraces of C., who met him at Laodicea, in Syria, 36 B.C., and accompanied him to the Euphrates. His general residence from this time was with her at Alexandria. He bestowed upon her and upon her children great estates, which, however, he had no right so to dispose of. Upon this and other accounts, he became the bject of great detestation at Rome, and war was declared against C., Antony being now regarded as her general. At her instigation, he risked the great naval battle of Actium (q.v.); and when she fled with 60 ships, he forgot everything else, and hastened after her. When Octavianus appeared before Alexandria, C. entered into private negotiations with him for her own security, which treachery becoming known to Antony, he vowed revenge; but a report coming to him that she had committed suicide, he thought it impossible to survive her, and fell upon his sword. Mortally wounded, and learning that the report which he had heard was false, he caused himself to be carried into her presence, and died in her arms. Octavianus, by artifice, succeeded in making her his prisoner. Failing to make any impression upon him, and finding that he spared her life only that she might grace his triumph at Rome, she took poison, or, as is said, killed herself by causing an asp to bite her arm. Her death took place in Aug., 30 B.C. Her body was buried beside that of Antony, and Octavia brought up the children whom she had born to Antony as if they had been her own.

CLEP'SYDRA, an ancient Greek musical instrument, described by Athenæus as having pipes which were made to produce a soft sound by the agitation of water forcing air into them. There were levers for admitting the water, thus forming a kind of hydraulic organ.

CLEPSYDRA (Gr. *klepto*, I conceal, *hydor*, water), an instrument for measuring time by the efflux of water through a small orifice. Two kinds have been in use—one wherein the fluid is simply allowed to escape through the orifice; the other, in which the uniformity of the flow is secured by maintaining the fluid at a constant level in the instrument. The first would, like a sand glass, give only an accurate measure of the time occupied in the escape of the whole fluid: of a shorter time, it would be an inaccurate measure, as the pressure under which the escape takes place at the commencement is greater than at any instant thereafter, and constantly diminishes with the height of the fluid column. In the second, the flow must be nearly uniform; and if the water be received into a uniform graduated tube as it escapes, we have a tolerably good clock. The rate of the flow, however, is affected by temperature and barometric pressure. The C. is supposed to have been used among the Chaldeans. The Romans employed it extensively. The invention of the pendulum has superseded it in modern times.

CLERC, JEAN LE, better known as JOHANNES CLERICUS, was b. at Geneva, Mar. 29, 1657, where his father was a clergyman. From an early period, he showed a particular aptitude for the study of ancient languages, and in this department he is still a conspicuous name. He also paid great attention to theology, and his numerous controversial writings brought him no mean reputation during his lifetime. Before he was 20, C. had imbibed heterodox opinions in religion. In 1678, he went as tutor to Grenoble, where he remained for two years; in 1680, he returned to Geneva, and was appointed to the clerical office. All the while, his objections to the accepted theology of the day had been growing; the works of Curcellæus and of Episcopius confirmed this antipathy, and now he appeared as Liberius de St. Amore, the writer of 11 letters against the errors of the scholastic theologians—in short, as the partisan of the Dutch remonstrants. In the latter part of 1681, C. left Saumur, whither he hand gone to perfect his French, and went to Grenoble, and thence to London, where he preached six months to the Savoy congregation. Finally, he was appointed professor of philosophy, classical literature, and Hebrew at the remonstrant seminary of Amsterdam. He died 8th Jan., 1736. C.'s writings are very numerous; but his greatest service to posterity

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was the publication of a quarterly, the *Bibliothèque Universelle et Historique* (1686–93, 25 vols., in 8vo), followed up by the *Bibliothèque Choisie* (1703–13), and the *Bibliothèque Ancienne et Moderne* (1714–27). Other works of C.'s are—*Harmonia Evangelica* (1700); *Traduction du Nouveau Testament avec des Notes* (1703); *Ars Critica* (3 vols., 1712–30); and *Traité de l'Incrédulité* (1733). The first two are Socinian in their tendency. C.'s rationalism is still more manifest in a work entitled *Sentimens de quelques Théologiens de Hollande touchant l' Histoire Critique du Vieux Testament*, in which the special inspiration of the Scriptures is denied. His editions of several of the ancient classics prove both his learning and acumen.

CLERC, LAURENT, 1785–1869; b. France; he was a deaf mute, and without the sense of smelling, having when an infant fallen into a fire, seriously burning his face and head. He was taught in the institution for the deaf and dumb in Paris, becoming the favorite pupil of the abbe Sicard, and after eight years of study became himself a teacher. In 1816, he came to the United States with the Rev. Dr. Gallaudet, and the next year the two opened an institution for the deaf and dumb in Hartford, Conn. Clerc was a teacher of deaf mutes for more than half a century. At the age of 34, he married Miss Boardman, a deaf mute, who bore him several children, all of whom had the sense of hearing and could speak. His oldest son became an Episcopal clergyman.

CLERGY (Gr. *clēros*, a lot, an inheritance), a term very generally applied to the ministers of the Christian religion, in contradistinction to the *laity* (q.v.). This use of the term is very ancient, and appears to have gradually become prevalent, as the ministers of religion more and more exclusively, instead of the members of the Christian church equally, began to be regarded as God's "heritage" and "priesthood" (1 Pet. ii. 9, and v. 3), consecrated to him, and peculiarly his. The distinction between the C. and the laity became more marked through the multiplication of offices and titles among the C., the ascription to them of a place in the Christian church similar to that of the priests and Levites in the Jewish church, with peculiar rights and privileges, their assumption of a peculiar dress and of official insignia, the growth of monastic institutions, and the introduction of celibacy. In harmony with the notions on which this distinction is founded, is that of an indelible or almost indelible character derived from ordination, so that a renunciation of the clerical office is either viewed as an impossibility, or a sort of apostasy, These notions in their highest degree belong to the church of Rome. In the Protestant churches, the distinction between C. and laity is much less wide; and although the same terms are often used, it is rather conventionally than in their full signification. The employment of official robes by the C. preceded their assumption of a peculiar ordinary dress, and is not so intimately connected with any peculiar pretensions. Among the privileges accorded to the C. by the Roman emperors, and in the middle ages, was exemption from civil offices; among the rights asserted by them, and which caused much dispute, was exemption from lay jurisdiction, even in cases of felony. The C. were distinguished into the *higher C.* and the *lower C.*, the latter including janitors, acolytes, lectors, exorcists, etc. The term *secular C.* is the designation of priests of the church of Rome who are not of any religious order, but have the care of parishes. Monks who are in holy orders are designated *regular clergy*.

CLERGY, BENEFIT OF. See BENEFIT OF CLERGY

CLERGYMAN'S SORE THROAT. This disease first shows itself by huskiness of the voice, with more or less coughing, hawking, and expectorating, from an uneasy sensation in the throat, with a constant inclination to swallow. On examining the back of the throat its mucous membrane is seen covered with granulations, caused by an accumulation of secretion in the follicles. These sometimes burst and discharge their contents, and this is sometimes followed by ulceration. The disease is caused by too prolonged or powerful exercise of the voice. Perfect rest is of the utmost importance and a residence in a mild climate. Tonics are beneficial, but local applications are recommended in preference.

CLERK, in the middle ages, designated an ecclesiastic—the term indicating a man of science or of learning—extended at a later period to mean a complimentary title for men of learning, whether of the church or not. In modern times it indicates any one who makes and keeps records, public or private; but in the law it is still an appellation of the clergy. In the United States there is an official clerk to each house of congress, and to each house of a state legislature; also there are county, city, and town clerks, and others of lesser importance. In the law, the clerk is an important officer of any court. In mercantile and other business life there are almost innumerable varieties of clerks.

CLERK, JOHN, of Eldin, Mid-Lothian, Scotland, inventor of the modern naval system of breaking the enemy's line at sea, was the 6th son of sir John Clerk of Penicuick, bart. Though not a naval man, he studied deeply both the theory and practice of naval tactics, and in 1779 communicated to his friends a new maneuver for "breaking the

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enemy's line" in a naval battle. Visiting London the following year, he had some conferences on the subject with naval officers, among whom was sir Charles Douglas, lord Rodney's captain of the fleet in the memorable action of April 12, 1782, when the experiment was tried for the first time, and a decisive victory gained over the French. The principle was adopted by all British admirals, and led to many signal naval victories. In 1782, C. printed 50 copies of his *Essay on Naval Tactics*, for private distribution among his friends. It was reprinted and published in 1790; the 2d, 3d, and 4th parts were added in 1797; and the work was republished entire in 1804, with a preface explaining the origin of his discoveries. The maneuver was claimed by sir Howard Douglas for his father, admiral sir Charles Douglas, but C.'s right to it is indisputable. He died, 1812.—His son, JOHN CLERK (lord Eldin), was an eminent Scottish judge.

CLERK, PARISH, an official in the church of England, who leads the responses in a congregation, and assists in the services of public worship, at funerals, etc., but is not in holy orders. There is usually one in each parish. In cathedrals and collegiate churches, there are several of these lay-clerks; and in some cases they form a corporate body, having a common estate, besides payments from the chapter. Before the reformation, the duties were always discharged by clergymen.

CLERK TO THE SIGNET. See WRITER TO THE SIGNET.

CLERMONT, a co. in s.w. Ohio, on the Ohio and Miami rivers, reached by the Cincinnati, Portsmouth, and Virginia railroad; 496 sq. m.; pop. '90, 33,553. The soil is fertile: productions, wheat, corn, butter, wool, tobacco, etc. Co. seat, Batavia.

CLERMONT (in the middle ages, *Clarus Mons*, or *Clarimontium*) is the name of several towns in France. The most important is the capital of the department of Puy-de-Dôme, Clermont-Ferrand (the *Augustonemetum* of the Romans, in the country of the Arverni), which is finely situated on a gentle elevation between the rivers Bedat and Allier, at the foot of a range of extinct volcanoes, crowned by the peak of Puy-de-Dôme, about 5 m. distant from the town. It consists of the two towns of C. and Montferrand, upwards of a mile distant from one another, and connected by a fine avenue of trees. C. contains several remarkable buildings: the old Gothic cathedral, the corn and linen hall, the theatre, and the hôtel-dieu, or hospital. C. has several educational and scientific institutions, and a public library, in which are preserved some curious MSS. Pop. '96, 50,870, who carry on a variety of manufactures, and an extensive traffic in the produce of the district, and in the transit trade between Paris and the s. of France. There are two mineral springs in the town, which are used for bathing. That of St. Alyre is most remarkable, having deposited in the course of ages an immense mass of limestone; and the deposit at one part forms over a rivulet a natural bridge 21 ft. long. The whole district abounds in such springs. A multitude of Roman antiquities attest the Roman origin of the city. In the middle ages, C. was the residence of the counts of the same name, and became the seat of one of the oldest bishoprics of France. Several ecclesiastical councils were held here, the most remarkable of which was that in 1095, at which the first crusade was instituted by Urban II. A statue has been erected to Pascal, who was a native of Clermont.

CLERMONT EN BEAUVOISIS (CLERMONT SUR OISE), a t. in France, 36 m. n. of Paris; pop. '91, 5617. The town-hall, and church of St. Simon, date from the 13th c., and the hill on which the town is built is surmounted by an old castle of the 10th or 11th c., used in modern times as a penitentiary for women. C. was an important post in the middle ages. It was frequently taken and retaken in the wars with the English, and in 1487 it was surrendered to them as a ransom for the French leader, La Hire. Cassini, the astronomer, was born here.

CLEROMANCY (Gk., *Klêros*, lot *manteia*, divination), a kind of divination practised by throwing black and white beans, little bones, lots, or dice, and observing and interpreting according to certain rules the points or marks turned up.

CLE'RUS, a genus of insects of the order *coleoptera*, section *pentamera*, and of the great family or sub-section *serricornes*. They are beautiful beetles, generally found on flowers, and often on those of umbelliferous plants, but their larvæ feed on the larvæ of different kinds of bees: those of *C. apiarius*—a rare insect in Britain, but common in some parts of Europe—on the larvæ of the hive-bee. It is about half an inch long, greenish, the wing-cases scarlet with purplish blue bands. How the larvæ of this and other insects should be able to carry on their ravages with impunity in a bee-hive, has never yet been satisfactorily explained.

CLÉRY, JEAN BAPTISTE. 1759–1809; one of the devoted friends of Louis XVI., and one of the few attendants permitted to share his prison. A few days before the king's execution Louis shared a loaf of bread with C., that being the only proof of regard he was able to show him. C. published an account of the king's imprisonment.

CLÉSINGER, JEAN BAPTISTE AUGUSTE, born 1814; a French sculptor who first became noted by his bust of Scribe. Among a great many works from his chisel are "Girl Bitten by a Serpent," "Liberty," "Fraternity," "Gypsy Girl," "Cleopatra in the Presence of Cæsar," statues of Louise of Savoy and Sappho; equestrian statues of Francis I. and Napoleon I., for the Louvre; busts of Charlotte Corday, the emperor of

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Russia, etc. Clésinger married the daughter of the famous French authoress, George Sand. He d. in 1883.

CLETHRA, a genus of shrubs of the order *ericaceæ*, containing 2 species: *c. alnifolia*, the white alder or sweet pepperbush, found from Canada to the gulf, and *c. acuminata*, common along the southern Alleghanies. The flowers are white, and those of *c. alnifolia*, fragrant.

CLEVELAND (Cliff-land), a hilly district, with some picturesque fertile valleys, forming the e. part of the N. Riding of Yorkshire between Whitby and the Tees, and giving its name to a parliamentary division. Geologically, it consists of inferior oolite, but the coast and w. border are formed of lias. In the s. the hills rise 1300 to 1850 ft. Since 1851, hamlets have become populous towns, owing to the discovery of ironstone in the hills. See MIDDLESBROUGH.

CLEVELAND, a city, port of entry, and co. seat of Cuyahoga co., O., the second city of the state in commerce and population, lies on the s.w. shore of Lake Erie, at the mouth of the Cuyahoga river; lat. 41° 30′ 5″ n.; long. 81° 42′ 6″ w.; 138 m. n.e. of Columbus and 244 m. n.e. of Cincinnati. It has an altitude of 580 ft. above the sea; a mean summer temperature of 69.68°; winter, 28.32°. C. was surveyed in 1796 by Gen. Moses Cleaveland, agent and director of the Connecticut land company, which purchased the western reserve, including the site of the city. It obtained its first settler in 1797, but its early growth was very slow, and in 1830 it contained but 1035 inhabitants. Its first impetus was received in 1834 from the completion of the Ohio canal, connecting Lake Erie with the Ohio river at Portsmouth. During the war it made rapid progress because of the extraordinary demand for its principal products. Its pop. in 1890 was 261,353. Nine railroads enter the city, and five others have direct communication with it. Among the former are the Clev., Cin., Chic. and St. Louis, the Lake Shore and Mich. Southern, the N. Y., Chic. and St. Louis ("Nickel Plate"), and the N. Y., Lake Erie and Western. There are also many lines of steamers to the various lake ports. C. has remarkable advantages for the accommodation of its shipping. Two parallel piers built out 1200 ft. into the lake form a channel 200 ft. wide at the mouth of the river, and the many windings of the latter afford more than a dozen miles of conveniently accessible docks within the city. A branch of the Cuyahoga flowing westward, not far from the lake, and parallel with it, has been dredged out so as to make an excellent ship canal. In 1878, at an estimated cost of $1,800,000, the U. S. govt. began a breakwater to enclose a harbor of refuge, 360 acres in extent, with an opening of 500 ft. opposite the mouth of the river. The total length of the completed breakwater will be about 10,000 feet. The city is beautifully situated on elevated land which slopes gently toward the lake, and is divided unevenly by the C. river, the larger portion lying on the e. side of that stream. It is also intersected by Kingsbury and Walworth "runs," the e. and w. tributaries of the Cuyahoga. The land bordering the river is low and flat, and here lie many of the factories and car-shops, almost hidden from view. Among the many bridges spanning the C. and uniting the e. and w. sections of the city is a stone and iron viaduct, a remarkable work of engineering, completed in 1878 at a cost of $2,250,000. Its length is 3211 ft., and its width 64 ft. It has a drawbridge 332 ft. long, which is 68 ft. above the water level. The central viaduct, completed in 1888, extends across the river and connects with one which crosses Walworth run. The combined length of the two is 3931 ft., and there is a drawbridge 239 ft. long. A smaller viaduct (835 ft. long) spans Kingsbury run.

From the abundance of its shade trees, C. has been called the "Forest City." Its streets are from 80 to 100 ft. wide. Superior st., the main business thoroughfare, is 132 feet wide. It begins on the east side of the river near the lake and runs parallel with the latter. It soon reaches Monumental park, so called from the statue of Gen. Moses Cleaveland and the Soldiers' monument, which adorn it. This park has an area of 10 acres, and is divided into 4 squares by intersecting streets. From it the principal streets on the east side of the city diverge, somewhat like huge spokes in the section of a wheel. The far-famed Euclid avenue begins here, and extends beyond Lake View cemetery, over six miles. Near M. park this avenue is used for business purposes, but for the remainder of its length is built up with handsome private residences surrounded by tasteful and well-shaded grounds. Prospect st., just south of Euclid avenue, is but little inferior to it.

Among the many fine parks belonging to the city the largest is the magnificent Gordon park, received in 1892 by the bequest of W. J. Gordon. The beautiful Wade park (63 acres), presented to the people by its owner, J. H. Wade, in 1882, contains the statue of Com. Perry, formerly in Monumental park. Lakeview park on the lake shore (10 acres), and Southside park (9 acres), and the Circle on the west side of the river are also worthy of mention. Lakeview, the principal cemetery of C., contains more than 300 acres. Its great natural advantages and the skillful and tasteful manner in which they have been improved have made it one of the most beautiful in the country. Here stands the monument erected in 1890 to the memory of Garfield at a cost of $130,000, from the top of which a fine view of the city and its suburbs may be obtained.

Among the noteworthy buildings are the U. S. building, containing the custom house, post-office, and rooms for the federal courts; the building of the Society for

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Savings, city hall, county court houses, masonic temple, New England building (13 stories), C. medical college, homœopathic college, city infirmary, medical dept. of Wooster University, Union depot, Case hall, Northern Ohio Insane Asylum; public library; hospital; Case school of applied science, Adelbert college, formerly the Western Reserve college, removed from Hudson, O., to Cleveland and endowed with $500,000 by Amasa Stone in memory of his son; the Y. M. C. A. building, the new market, the Plymouth Cong., First Pres., and St. Paul's Epis. churches, and the R. C. cathedral. The ample water-supply of the city is pumped into large reservoirs from two tunnels sunk 90 ft. below the surface of the ground and running out for 1½ miles to a crib at the bottom of the lake. The business establishments reporting in 1890 numbered 2307; capital, $69,732,761; hands, 50,674; wages paid, $28,355,505; and the value of the products, $113,240,115. The manufactures include iron and steel, refined petroleum, woolen goods, sulphuric acid, wooden ware, agricultural implements, sewing-machines, railroad cars, marble, bricks, white lead, aluminium, bicycles, wire, safes, bolts and screws, etc.

At the mouth of Kingsbury run are the Standard oil works, covering several acres. The refining of petroleum is one of the leading industries. Seven establishments in 1890 reported a capital of $10,426,698. In shipbuilding, 8 establishments reported a capital of $2,562,775. The annual value of its steel and iron product is over $36,000,000. In 1896 the commerce of the Cuyahoga district was, imports, $1,498,371, exports, $1,948,995; the city had an area of 32 sq. m., the assessed valuations exceeded $135,000,000; and the net debt was over $5,700,000.

In Apr., 1891, a new city charter, intended to separate the legislative and executive branches of the municipal government, went into effect. An elective mayor has the power to appoint a cabinet of six members, subject to the confirmation of the municipal legislature, which consists of twenty councilmen, two for each of the ten districts into which the forty wards of the city are divided. Each member of the mayor's cabinet is director of a department (law, public works, accounts, police, fire, and charities and correction), and has the absolute power to appoint the subordinate officers in his own department, although firemen and policemen are under the protection of the Civil Service Reform rules. The mayor and directors constitute a "Board of Control." The city treasurer, police judge, prosecuting attorney, and clerk of the police court are elected by the people.

CLEVELAND, town and co. seat of Bradley co., Tenn., on the Southern railroad; 30 m. e. of Chattanooga; in an agricultural and fruit-growing region; has manufactures of woolens, leather, woodenware, stoves, pumps, brick, and terra-cotta, flour, etc., churches, Centenary female college, weekly newspapers, an opera house, banks, waterworks and street railroads. Pop. '90, 2863.

CLEVELAND, a co. in s. Arkansas; formed 1873; name changed from Dorsey, 1885; crossed by Saline river; w. boundary, Bayou Maro; soil fertile, with extensive forests of cypress, hickory, pine, and gum; 693 sq. m. Pop. '90, 11,362. Co. seat, Rison.

CLEVELAND, Charles Dexter, 1802–69; a native of Massachusetts, graduated at Dartmouth in 1827; professor of Latin and Greek at Dickinson college, and of Latin in the university of the city of New York. In 1861 he was appointed U. S. consul at Cardiff, Wales. Among his publications are *The Moral Characters of Theophrastus; Compendium of Grecian Antiquities; Compendium of Grecian Literature; Hymns for Schools; English Literature of the Nineteenth Century;* and *Lyra Americana.*

CLEVELAND, John, 1613–58, English poet. He was on the Royalist side in the Civil War and was appointed judge-advocate in the king's army. He satirized the Parliamentarians, and in 1655 was imprisoned for a short time, but Cromwell ordered his release. His works were very popular in their day, but his serious verses have little merit.

CLEVELAND, Stephen Grover, twenty-second President of the U. S., was born at Caldwell, Essex co., N. J., 1837, March 18. When he was three years old his father, a Pres. minister, received a call to Fayetteville, N. Y. Young C. was educated in the public school of that village and in an academy in Clinton, N. Y. The death of his father, 1853, threw him on his own resources at the age of sixteen, and he became bookkeeper and assistant teacher in the New York institution for the blind. Two years later he started for the west, intending to settle in Cleveland, O., and study law. But while passing through Buffalo, his uncle, William F. Allen, induced him to remain in that city, and entered him as a student with a prominent law firm. He was admitted to practice, 1859; became assistant dist.-atty. for Erie co., 1863; was the Democratic candidate for dist. atty., 1865, but was defeated at the polls; and in 1870 was elected sheriff of the county. At the conclusion of his term of office he became a member of the law firm of Bass, Cleveland & Bissell, which in 1881 became Cleveland, Bissell & Sicard. In Nov., 1881, he was nominated Democratic candidate for mayor of Buffalo. That city was strongly Republican, but long-continued tenure of office had engendered flagrant corruption, and good men of all parties joined to uproot it. C. was elected by a handsome majority. He reorganized the departments under his charge on business principles, conquered corrupt combinations, and promptly vetoed all measures which savored of extravagance or jobbery. In 1882 he received the Democratic nomination for gov. of N. Y. His opponent was Charles J. Folger, then secretary of the treasury under Pres. Arthur. The Republican party in the

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state was divided, and among the independent voters there was strong dissatisfaction with the methods which had secured Mr. Folger's nomination. Mr. C.'s reputation as a reformer was also in his favor. He was elected by the extraordinary majority of 192,854. For the most part his conduct as governor was marked by integrity and good judgment, and he was early spoken of as a candidate for the presidency. At the Democratic national convention, July, 1884, he was the leading candidate on the first ballot, and in spite of a zealous minority of delegates from his own state, secured the necessary two-thirds of all the votes on the second ballot. A large body of Independent Republicans declared in his favor, but the accession of this new element was partly offset by the defection of many Democrats. C. received 219 electoral votes as against 182 for his opponent, these votes, beside those of all the southern states, including those of Conn., N. Y., N. J., and Ind. He was inaugurated 1885, March 4; married, 1886, June 2, to Miss Frances Folsom. His term was mainly characterized by his very bold advocacy of a reduction of tariff duties, and by his opposition to what he considered unworthy bills. During the session ending Aug. 5, 1886, he vetoed 115 out of 987 bills that had passed both houses of congress. Of this number, 102 were private pension bills. During this same session he directly antagonized the senate by refusing to give that body his reasons for removing certain officers or to deliver up the papers ordering said changes; claiming that the president is not amenable to congress for such acts, and that the papers were not official documents. Considering the immense difficulties surrounding such an undertaking, his supporters maintain that his civil service reform pledges were carried out as consistently as possible. He was renominated for the presidency at St. Louis, June 7, 1888, but was defeated, receiving only 168 electoral votes to Harrison's 233. On the expiration of his term of office he resumed, in New York city, the practice of law, but still kept in touch with the political interests of his party. At the National Democratic Convention of June, 1892, although opposed by the delegation of his own state, he was nominated for the presidency on the first ballot, and on the election in November was elected, receiving 277 electoral votes as against 145 for Harrison and 22 for Weaver. Leading events of his second term were the withdrawal of the Hawaian annexation treaty (1893), his attempt to restore Queen Liliuokalani, the gold drain, by which several issues of bonds became necessary (1894), great railroad strike in the summer of 1894, the appointment of the Venezuelan commission (1896), and his settlement as arbitrator of several foreign boundary disputes.

CLEVES (Ger. *Kleve*), a t. of Rhenish Prussia, 48 m. n.w. of Düsseldorf. It is situated on three gentle elevations, about 2½ m. from the Rhine, with which it communicates by canal, in the midst of a rich and beautiful country. It is divided into an upper and a lower t., is well built, in the Dutch fashion, and surrounded by walls. It has a fine old castle, partly built on a commanding rock, in which Anne of Cleves, one of the wives of Henry VIII., was born, and an ancient collegiate church. C. has manufactures of machinery, tobacco, etc. Pop. '90, 10,409. C. was anciently the capital of a duchy extending along both banks of the Rhine, and which passed by marriage to the reigning house of Prussia.

CLEW. The lower corner of a square sail, or the after corner of a fore-and-aft sail. Hammock clews are the small nettles by which it is suspended. Clew-garnet, a rope used for hauling up the clew of a course. Clew-iron, a shackle-shaped iron in the clews of large sails. Clew-jigger and clew-line, used for hauling up the clews of top-sails, the latter is also used on top-gallant sails and royals to clew up the sails.

CLEW BAY, an inlet of the Atlantic, on the w. coast of Mayo co., Ireland, 15 m. long by 8 broad. Some of the mountains on the n. rise 1200 to 2500 ft., but the land on the e. is lower, and leads to Westport, Newport, and Castlebar.

CLICHÉ (Fr.), the impression made by a die in melted tin, or other fusible metal. It is the proof of a medalist's or die-sinker's work, by which they judge of the effect, and ascertain the stage of progress which they have reached before the die is hardened. The same term is applied by the French to stereotype casts from wood-cuts.

CLICHY LA GARENNE, a suburb of Paris, in the department of Seine, about four m. n.w. of the capital. Pop. '91, 30,698.

CLICK-BEETLE, the popular name of many species of coleopterous insects of the tribe *elaterides* (see ELATER), the parents of the destructive larvæ too well known to farmers by the name of wire-worms (q. v.). They derive the name click-beetle from the sound which they make when, being laid on their back on any hard substance, they regain their feet by a spring, in the manner characteristic of the tribe to which they belong. The British species are numerous, the largest not quite half an inch long; none of them brilliantly colored; all very similar in form, rather elongated, and the thorax and abdomen nearly of equal breadth throughout. SKIP-JACK is another popular name for them. The striped click-beetle (*agriotes* [*cataphagus* or *elater*] *lineatus*) is the parent of a very destructive kind of wire-worm. See illus., BEETLES, ETC., vol. II.

CLIFF-DWELLERS, inhabitants of dwellings built on projections from the face of cliffs, or cut out of the solid rock, found in various parts of the world. The ancestors of the present Pueblo Indians built such houses in the canyons and cliffs of New Mexico

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and the neighboring country. In some instances the houses are four stories high, and divided into many rooms. Often they are not to be distinguished from the rest of the cliff. They were probably reached by ladders and designed as strongholds. Walnut canyon in n.e. Arizona has a row of cliff dwellings extending more than five miles. S.w. Colorado is the region richest in these remains. The cliff-villages are also found farther south. Such a town, Atitlan, was inhabited at the time of the Spanish conquest. But, with the probable exception of the Pueblos, the race is now extinct. In the eastern hemisphere similar remains are found in the island of Thora, in the Greek archipelago; at Petra in Arabia Petræa; at Assos in Asia Minor; in the island of Minorca, and especially in the remarkable cliff-town Albinon in the canton of Valais, Switzerland.

CLIFFORD, JOHN HENRY, LL.D., 1809–76, b. R. I., graduated at Brown univ., 1827; attained an eminent position at the bar; was in the Mass. legislature, and at one time president of the senate; appointed atty.-gen. of Mass.; elected gov. 1853. He was again atty.-gen. for four years; and was for a time pres. of the board of overseers of Harvard univ.

CLIFFORD, NATHAN, 1803–81; b. Rumney, N. H. He graduated at the Hampton literary institution, supporting himself during his studies; was admitted to the bar, and commenced practice in York co., Me., 1827. He was in the state legislature as a Democrat, 1830–34, was elected to congress, 1838, was U. S. atty.-gen. in the cabinet of Pres. Polk, and from 1858 until his death was associate justice of the supreme court of the U. S.

CLIFFORD, WILLIAM KINGDON, F.R.S., late prof. of applied mathematics and mechanics at University college, London, and one of the foremost mathematicians of his time, was b. at Exeter, May 4, 1845. He was educated at a school in his native town, at King's college, London, and at Trinity college, Cambridge. While at Trinity, he did not confine himself to examination subjects, but read largely in the great mathematical writers, and was second wrangler in the mathematical tripos of 1867. At this time, while excelling in gymnastics, he would also solve and propound problems in the pages of the *Educational Times*, and could discuss with ease complicated theorems of solid geometry without the aid of paper or diagram. A high-churchman at first, C. before taking his degree threw off all conventional restraints, and eagerly discussed some of the religious questions of the day. In Aug., 1871, he was elected to the chair of mathematics and mechanics at University college, London, which post he retained until his untimely death at Madeira, Mar. 3, 1879. C. first established his reputation as an original thinker with the faculty of expressing scientific thought in plain and simple language by a lecture at the royal institution, *On Some of the Conditions of Mental Development.* He was a valued member of the London mathematical society, contributing to the *Proceedings;* for a time he acted as secretary, and afterwards vice-president of the mathematical and physical section of the British association; he also lectured to the Sunday lecture society on such subjects as *Ether; Atoms;* and *The Sun's Place in the Universe.* The versatility of his mind for philosophical and scientific discussion was further shown by his varied contributions to periodical literature. Besides these articles, he issued the first part of a larger text-book, *Elements of Dynamics* (1878).—See C.'s *Lectures and Essays,* edited by Leslie Stephen and F. Pollock, 1879.

CLIFTON, a beautiful and favorite watering-place in the s.w. of Gloucestershire, forming the western suburb and part of the parliamentary borough of Bristol. It is built on the sides and top of a carboniferous limestone hill, 308 ft. high; commands fine picturesque views; and is separated from a similar cliff by a deep chasm on the s., through which flows the navigable Avon. The rock abounds in fossils and quartz, or Bristol diamonds. It has a tepid spring of 73° F. which contains carbonic acid and salts of magnesia, and was brought into notice about 1695. Population, 1891, about 29,300. See BRISTOL.

CLIFTON SPRINGS, a village and health resort in Manchester and Phelps tps., Ontario co., N. Y. It is on the Lehigh Valley and the N. Y. Central and Hudson River railroads, 10 m. e.n.e. of Canandaigua; is situated amid beautiful scenery, and is famous for its calcic sulphur waters, which have been found useful for many complaints. Another spring is highly charged with carbonic acid. The sanitarium connected with the springs is a well-known institution, and the village has a seminary, a union school, churches, and a weekly newspaper. Several deposits of salt have been discovered here. Pop. 1890, 1297.

CLIFTON, or SUSPENSION BRIDGE, former name of the town of NIAGARA FALLS (q. v.), Ontario, Canada.

CLIMACTERIC YEAR. It was long believed that certain years in the life of man had a peculiar significance to him, and were the critical points, as it were, of his health and fortunes. The mystical number 7 and its multiples (e.g., 35, 49) constituted crises of this kind. The most important of all was the 63d year, called, by way of eminence, the "climacteric year" or "grand climacteric," which was supposed to be fatal to most

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men; its influence being attributed to the fact, that it is the multiple of the two mystical numbers 7 and 9.

CLIMATE (from the Greek *klima*, a slope or inclination, afterwards applied to a tract of country, with reference to its supposed inclination to the pole, and the effect of the obliquity of the sun's rays upon the temperature), a term now employed as including not merely the conditions of a place or country with regard to temperature, but also its meteorological conditions generally, in so far as they exercise an influence on the animal and vegetable kingdoms. The effect of the sun's rays is greatest where they fall perpendicularly on the surface of the earth, and diminishes as their obliquity increases; the surface which receives any given amount of the sun's rays increasing with their increased obliquity; whilst at the same time the oblique rays being subjected to the influence of a greater number of particles of the atmosphere, a greater amount of their heat is absorbed before they reach the surface of the earth at all. The greater or smaller extent of surface receiving a certain amount of heat, also makes important differences to arise from *exposure* by slope towards the equator or towards the nearest pole. *Elevation* is a most important cause of differences of climate. As we ascend from the level of the sea to the greatest mountain altitudes, even at the equator, the temperature gradually diminishes, owing to the diminished density of the atmosphere, and we reach a region of perpetual snow, as in approaching the poles. The progressive diminution of the temperature is, however, affected by many other causes, so that the line of perpetual snow is far from being at the same elevation in all places of the same latitude. Thus, the snow-line on the southern side of the Himalayas is depressed by the moisture of the aërial currents from the Indian ocean; and that on the northern side is elevated by the radiation of heat in the vast dry table-lands of Central Asia, and the consequent ascending streams of warm dry air; so that the difference between the two is not less than 4,000 ft. in favor of the *northern* side of the mountain-ranges; and Humboldt says, "millions of men of Thibetian origin occupy populous towns in a country where fields and towns would, during the whole year, have been buried in snow, if these table-lands had been less continuous and less extensive." As the actual temperature of the atmosphere depends not so much upon the direct rays of the sun as upon the radiation from the heated surface of the earth, the diversities in the character of that surface are productive of great effects in modifying climate. A sandy desert, a tract of country clothed with luxuriant vegetation, and an expanse of water, absorb and radiate heat in very different degrees. A newly plowed field both absorbs and radiates heat much more rapidly than a field covered with grass. A sandy desert heats the atmosphere above it much more than either a fertile tract or a watery expanse, and a watery expanse still less than a fertile tract; but, on the other hand, the desert cools sooner by radiation; whilst the heat absorbed by the water being diffused through a larger mass—partly by reason of the motion continually taking place in the fluid substance—and affecting greater depths, the influence of the ocean, of seas, and of great lakes, is very powerful in maintaining a greater equality in the temperature of the atmosphere. Thus maritime places, and particularly islands and peninsulas, have a more equal temperature, with less diversity of the extremes of summer and winter, than more inland or continental places otherwise similarly situated. The effect of the sea is modified by many circumstances, and particularly by currents, of which the Gulf stream (q.v.) affords a notable instance, the heated water conveyed by it from the equatorial to the polar regions having a great influence on the C., particularly of the n.w. of Europe. The temperature of Europe is also in part dependent on the warm s. winds, which have absorbed heat from the great sandy deserts of Africa; and over the world generally, atmospheric currents must be regarded as exercising even a greater influence on C. than oceanic currents. The quantity of rain or snow that falls in the course of a year, and the times and manner of its falling, are circumstances which have a great effect on climate. These are circumstances much influenced by the distribution of land and water, and by the elevation and character of the surface of the land, which, doubtless, also influence electric and other meteorological conditions, less understood, but certainly not unimportant.

The relations of C. to vegetation are determined not merely by the mean annual temperature, but in a great measure also—and, with regard to many plants, entirely—by the duration and C. of summer. Thus, maize, which may be mentioned as an important example, succeeds well in climates of which the winter-cold is severe, the summer season alone being sufficient for its whole life; whilst, on the other hand, such plants as fuchsias, some kinds of laurel, and even the common hawthorn, which succeed well enough where maize would scarcely put forth an ear, would perish from the colder winters of countries where it is profitably cultivated. The polar limit of particular species of animals, except those which hibernate, is generally determined by the degree of winter-cold which they can bear without injury.

Bogs and marshes exercise an unfavorable influence on C., cooling the air and causing fogs, as clay-soils also to some extent do, through their retentiveness of moisture; whilst marshes of some kinds, and in some situations, abound in exhalations very unfavorable to health. Similar remarks apply to large tracts of forest. The clearing, drainage, and cultivation of land have generally favorable effects on C.; although plantations are often beneficial for shelter; and a too complete removal of natural forests may pre-

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vent the deposition of moisture from the atmosphere to such a degree as to cause droughts, a result strikingly exemplified in some of the smaller West India islands, and the tendency to which is said to be manifested on the great scale in the eastern part of the continent of North America.

The important and difficult subject of C. will be found further elucidated in some of the principal geographical articles, and in the articles AGRICULTURE; ARBORICULTURE; ATMOSPHERE; METEOROLOGY; MONSOONS; RAIN; SEASONS; STORMS; WEATHER; WIND.

CLIMAX, a Greek word signifying primarily a *stair*, and in rhetoric, that artifice which consists in placing before the mind of the reader or hearer a series of propositions or objects so arranged that the least forcible strikes it first, and the others rise by successive gradations in impressiveness.

CLIMBERS, *Scansores*, in ornithology, an order of birds generally characterized by having two toes before opposed by two toes behind, so as to adapt their feet in a remarkable degree for the purpose of grasping the branch of a tree or any similar object. Many have not two toes permanently directed backwards, but have the power of turning one of the front toes backwards at pleasure. Some have only three toes, but yet on other accounts are unhesitatingly ranked in this order. The families of the C., however, differ very much in many respects, although agreeing in the structure of their feet. To this order belong parrots, toucans, trogons, barbets, woodpeckers, and cuckoos. It has been objected to the name C., that although very descriptive of the habits of some birds of this order, as woodpeckers, it is not very applicable to others, as cuckoos, whilst there are birds of other orders, as creepers, which possess this habit in the greatest degree; and the name has been changed by some ornithologists into *yoke-footed* or *zygodactylous birds*. It is generally the outer front toe which is directed backward in this order; but in the trogons, the first and second toes are opposed to the third and fourth.

CLIMBING FERN, *Lygodium palmatum*, a species of fern found, rarely, from Massachusetts to Virginia and Kentucky, remarkable for climbing or twining around weeds and shrubs. The leaves are broadly palmate, and the fertile frondlets form a panicle upon the upper portion of the stem. It is prized for interior decoration of houses.

CLIMBING PERCH, *Anabas scandens*, the only well-ascertained species of a genus of fishes, from which the family *anabasida* (q.v.) derives its name. It is a native of rivers and ponds in most parts of the East Indies. It is about 6 in. long. In general form, it somewhat resembles a perch, and the resemblance is increased by the large scales and the spiny dorsal fin. That this fish climbs trees, has been asserted by observers whose veracity and accuracy cannot easily be questioned; yet others, who have enjoyed ample opportunity of observation, express great doubt concerning this habit. In climbing, the fish is said to suspend itself by its spiny gill-covers, and by fixing its anal fin in cavities of the bark, urging its way upwards by distending and contracting its body. There is no doubt that it often leaves pools when they are in danger of being dried up, and travels in search of water. Though these fish are sometimes compelled in their distress to travel by day, and have been met in the glare of noon toiling along a dusty road, their migrations are generally performed at night or in early morning, whilst the grass is still wet with dew. Climbing perches are plentiful in the Ganges, and the boatmen have been known to keep them for five or six days in an earthen pot without water. See illus., FISHES, vol. VI.

CLIMBING PLANTS, or CLIMBERS, are, in the most extensive and popular sense of the term, those plants which, having weak stems, seek support from other objects, chiefly from other plants, in order to ascend from the ground. This, however, is accomplished in very different ways. Some climb by means of small root-like processes growing from the stem, as the ivy; some by means of *cirri* or tendrils, which twine round branches of trees, etc. (see CIRRUS); some by adhering disks, of which a beautiful instance is to be seen in the well-known Virginian creeper; and many by the twining of their own stems around those to which they cling. Twining plants generally turn only in one direction, either from right to left, or from left to right. The scarlet-runner and passion-flower are examples of the former; the honeysuckle and hop of the latter. Twining plants are not always included under the designation climbing plants. The woody twining plants, which form one of the most remarkable features of tropical forests, are often called *lianas* (q.v.).

CLINCH, a co. in s.e. Georgia, on the Florida border, intersected by the Little Suwannee river and the Plant System of railroads; 988 sq.m.; pop. '90, 6652, incl. colored. It is a level and swampy region; chief productions, rice, corn, cotton, oats, etc. Co. seat, Homerville.

CLINCHER-BUILT, or CLINKER-BUILT, is a name applied in ship-building, when the lower edges of the side-planks overlap the row next under them, like slates on the roof of a house. If the planks are all smooth, meeting edge to edge, the construction is called *carvel-built*. This construction requires that the seams should be very close, and calked with oakum. Boats are often *diagonal-built;* two layers of planking, rising in opposite directions from the keel at an angle of 45°. In iron ships, the clincher arrangement is called *lap-jointed*, and the carvel arrangement *jump-jointed*.

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CLINCH RIVER, rising in s.w. Virginia, flows into Tennessee between Clinch and Powell mountains, joining with the Holston, and forming the Tennessee. Its length is about 200 miles.

CLINGMAN'S DOME, the highest peak of the Smoky mountains in North Carolina, on the border of Tennessee. It is 6,600 ft. above the sea level; and is the second highest of the Appalachians.

CLINIC BAPTISM (Gr. *klinē*, a bed), in the ancient church, baptism administered to a person on a sick-bed or death-bed. The practice and the term alike indicate notions concerning baptism which have no foundation in Scripture, and which, although once extremely prevalent, have now almost entirely disappeared.

CLINIC MEDICINE is that department of the art which is occupied with the investigation of diseases at the bedside, or individually.

CLINKER-BUILT. See CLINCHER-BUILT.

CLINKERS, the name given to the scales or globules of black oxide of iron, obtained from red-hot iron under the blows of a hammer. The same term is applied to the slag of iron-furnaces. By geologists the cindery-like masses which form the crust of some lava streams are called clinkers. By clinkers is also meant a mass composed of several bricks united together by the action of the heat in the kiln.

CLINKSTONE, or PHONOLITE, is a grayish green feldspathic rock, remarkable for its tendency to lamination, which is sometimes such that it affords tiles for roofing. It is a compact homogeneous rock, passing gradually into gray basalt. The slabs give a metallic ring or "clink" when struck with a hammer, whence its name. It occurs in volcanic districts.

CLINOM'ETER, an instrument for the purpose of taking the dip and strike of a stratum. It consists of a compass provided with a small spirit-level, and on the lid—which can be fixed at right angles to the compass-box—there is a small graduated quadrant, and a plumb-line.

CLINTON, a co. in s.w. Illinois, on Kaskaskia river, intersected by the Illinois Central and the Baltimore and Ohio Southwestern railroads; 494 sq.m.; pop. '90, 17,411. It consists of fertile prairies with tracts of forest land. Productions, chiefly agricultural. Co. seat, Carlyle.

CLINTON, a co. in central Indiana, reached by the Lake Erie and Western, and several other railroads; 400 sq.m.; pop. '90, 27,370. Its surface is mostly of forest and prairie lands; chief business, agriculture. Co. seat, Frankfort.

CLINTON, a co. in e. Iowa, on the Mississippi river, intersected by the Chicago and Northwestern and other railroads; 680 sq. m.; pop. '90, 41,199. It has a surface of prairie and forest, with generally fertile soil, producing the usual agricultural crops. Co. seat, Clinton.

CLINTON, a co. in s. Kentucky, on the border of Tennessee, bounded n. by the Cumberland river; 220 sq.m.; pop. '90, 7047, with colored. The surface is hilly, and in some parts mountainous. Agriculture is the chief business. Co. seat, Albany.

CLINTON, a co. in Central Michigan, on Grand, Maple, and Looking-glass rivers, reached by the Detroit, Grand Rapids and Western, and the Michigan Central railroads, The chief business of the people is agriculture. Co. seat, St. Johns. Pop. '90, 26,509. Area, 580 sq. m.

CLINTON, a co in n.w. Missouri, reached by the Atchison, Topeka, and Santa Fé, the Chicago, Rock Island, and Pacific, and the Hannibal and St. Joseph railroads; 440 sq. m.; pop. '90, 17,138, with colored. The surface is chiefly prairie, but there is plenty of woodland. Productions, agricultural. Co. seat, Plattsburg.

CLINTON, a co. in n.e. New York, on the Canada border, bounded e. by lake Champlain and s. by Ausable river, and traversed by the Chateaugay, the Vermont Central, and the Delaware and Hudson railroads; 995 sq. m.; pop. '90, 46,437. The soil is fertile, level near the lake and hilly further inland. There is abundance of iron ore of the best quality. Chief productions, wheat, corn, oats, buckwheat, hay, butter, wool, and maple sugar. The Clinton state prison is at Dannemora, in this county. Co. seat, Plattsburg.

CLINTON, a co. in s.w. Ohio, traversed by the Cincinnati and Muskingum Valley, and the Baltimore and Ohio railroads; 384 sq. m.: pop. '90, 24,240. Surface undulating and soil fertile. The chief business is agriculture. Co. seat, Wilmington.

CLINTON, a co. in central Pennsylvania, on the Susquehanna river, traversed by the Pennsylvania canal, the Beech Creek, and the Pennsylvania railroads. Surface mountainous; chief occupations, agriculture and lumbering. Co. seat, Lock Haven. Pop. '90, 28,685. Area, 850 sq. m.

CLINTON, a city and co. seat of Clinton co., Iowa, on the Mississippi river 42 miles above Davenport; pop. '90, 13,619. It is on the Chicago and Northwestern railroad, at the junction of several other railroads. The Mississippi is crossed at Clinton by a bridge 4100 ft. long. In the city are the repair shops of the railroad and a number of manufactories. It has a large and rapidly increasing trade. Lumber and grain are largely exported.

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CLINTON, town and judicial seat of East Feliciana parish, La.; 85 m. n.w. of New Orleans. The pop. in 1890 was 974. There is railroad communication with Port Hudson, and the town has large shipments of cotton.

CLINTON, a town in Worcester co., Mass., 45 miles w. of Boston and 16 miles n.e. of Worcester; on the Nashua river and the Boston and Maine and the New York, New Haven, and Hartford railroads. The river supplies abundant water-power for manufacturing, which includes cottons, machinery, wire-cloth, worsted, trunks, Brussels and Wilton carpets, etc. The Lancaster or gingham mills are the finest of the kind in the United States. There are several churches, high school, public library, electric lights, several newspapers, national and savings banks, etc. Pop. 1890, 10,424.

CLINTON, a t. in Hunterdon co., N. J., 31 m. n.w. of Trenton, on the s. branch of Raritan river, and the New Jersey Central railroad; pop. '90, 3684; of the borough, 785. It is in the midst of a fine agricultural region, and has many important manufactories.

CLINTON, a village in Oneida co., N. Y., on Oriskany creek and the N. Y., Ontario and Western railroad, 9 miles w. of Utica. It is the seat of Hamilton college, and has manufactures of cotton, lumber, iron, and other articles, the Cottage and Houghton seminaries, and several newspapers. Pop. '90, 1296.

CLINTON, a town in Huron co., province of Ontario, Canada, 13 m. from Goderich, on a branch of the Grand Trunk railroad; pop. 1891, 2635. In and near the town are valuable salt wells and a deposit of rock-salt 20 ft. thick. There are various manufactories, and a large trade in grain and produce.

CLINTON GROUP, in geology, a name given to a subdivision of the Upper Silurian strata.

CLINTON, CHARLES, 1690–1773; a native of Ireland, and progenitor of the Clintons of New York, of whom his grandson De Witt was the most famous. The grandfather of Charles was an adherent of Charles I., and fled to the n. of Ireland on the fall of the king. After a voyage in which a number of the emigrants starved to death, C. landed at cape Cod in 1729, and in 1731 settled in Ulster co., N. Y., where he was a farmer, a land surveyor, and a judge of the local court. In 1756, with two of his sons, he served in the campaign against Fort Frontenac.

CLINTON, DE WITT, American statesman, was b. at Little Britain, New Windsor, N. Y., in 1769, and was the son of James Clinton and Mary De Witt, and grandson of Charles Clinton (q. v.). His paternal ancestors, although long resident in Ireland, were of English origin, and his mother was of Dutch-French blood. He was educated at Columbia college, graduating with high honors. Choosing the law for his vocation, he studied under Samuel Jones, afterwards chief justice of the United States superior court. Admitted to the bar in 1788, C. entered immediately into political life, becoming an ardent supporter of his uncle, George Clinton, who was governor of the state (from 1777 to 1795 and from 1801 to 1804), and the leader of the republican party. Young C. took an active interest in the adoption of the federal constitution, and reported for the press the proceedings of the convention held for that purpose; about the same time and afterwards acting as his uncle's private secretary. His first office was secretary of the board of regents of the university; and the next, secretary of the board of commissioners of state fortifications. He opposed the administration of John Adams, and also that of John Jay, governor of the state; but while opposing Adams's hostility to France, he raised and commanded an artillery company to resist the French in case war should come. In 1797, he was elected to the state assembly as a representative of New York city, where he made his residence, and the next year was chosen state senator for four years. By virtue of his senatorial office, C. became a member of the council of appointment, a body consisting of one senator from each district to whom the governor made nominations for state and local offices. Up to this time the governor had exercised the exclusive right to make nominations; but C. vigorously attacked the system, and succeeded in procuring an amendment to the constitution giving the members of the council of appointment equal rights of nomination with the governor. During this period C. found time to devote himself to scientific and social questions, studying natural history, and other sciences. The protection and improvement of the public health, and the enactment of laws in favor of agriculture, manufactures, and the arts, and especially the use of steam in navigation, engaged his restless mind. He labored also for the abolition of slavery, and of its kindred barbarism, imprisonment for debt. In 1802, when but 33 years of age, he was appointed a senator of the United States, where he greatly increased his popularity, particularly by his wise and moderate counsel in a high excitement then existing against Spain in consequence of alleged violation of treaty stipulations affecting the Mississippi and its trade. Before his term in the senate expired, C. resigned to accept the office of mayor of New York, an appointment made by his uncle, the governor, and the council of appointment. He held the mayor's office four years; was removed; again appointed in 1809; again removed in 1810; finally appointed in 1811, again holding four years, through the period of the war with England. He was also a member of the state senate from 1805 to 1811; lieutenant-governor for the next two years, and for part of this time again

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a member of the council of appointment. In 1804, his uncle, the governor, was elected vice-president of the United States, and soon afterwards, by reason of age, retired from political life, leaving the partisan scepter of the Clintons in the hands of De Witt, who speedily became the leader of the republican party in New York, and their candidate for president, near the close of Madison's first term. Madison, backed by his war record, was easily nominated by the republican congressional caucus; but the New York section of the party insisted on running Clinton. The result was a disastrous defeat for the latter, he having but 89 electoral votes to 128 for Madison. This severe blow led C. to a temporary cessation of political work, and he turned his attention to less exciting subjects. His partisan opponents considered his political life at an end; but they were wrong. He took a leading part in establishing the free-school system of New York city, and in the establishment and promotion of various institutions of science; in the improvement and modification of criminal laws; in the extension of agriculture and manufactures; in the relief of the poor, the improvement of morals, and the advancement of all worthy objects. For many years no important movement was made in these and kindred matters with which he was not identified, and oftener than otherwise as the master spirit. All these, however, were little in comparison with the great object on which his fame securely rests—the Erie canal. He was an early and energetic advocate of internal improvements, especially such as could connect the great lakes by navigable channels with the tide-water of Hudson river, and no man so eloquently or so prophetically set forth the great advantages that such works would bring to New York city. How these prophecies have been fulfilled the position of that city as the commercial center of the two Americas will attest. It would require many pages to record with what zeal, tireless energy, patience, and hope, he labored for this great object. "Clinton's folly" was the by-word of scoffers through dark years of discouragement, but he never despaired, never yielded an inch, until, a dozen years after his great political defeat, a line of cannon stationed at intervals along the much ridiculed "ditch," and starting their firing at Buffalo, awakened the people of the "Empire State" to the fact that the waters of lake Erie were pouring through the canal, bearing on their waves the message that the great lakes were on that day wedded to the ocean. In the mean time he was never entirely out of the political field. In 1816, the governor (Daniel D. Tompkins) was chosen vice-president, and resigned the governorship. C. was brought forward for the place, bearing not only the odium of advocating the "big ditch" and of the crushing defeat as a presidential candidate four years before, but the additional ignominy of having been but one year before removed from the office of mayor of New York by a council of appointment controlled by his own party. To run for governor seemed madness, yet the innate power and greatness of the man gave him an easy victory, and he was elected by a heavy majority. He was re-elected in 1820, in 1824, and in 1826. In 1822, he was out of the field, and his enemies once more celebrated his political funeral, adding, in the course of their two years' rule, the indignity of removing him from the office of commissioner of the canal then under way. This outrage was more than the people could bear, and C. was at once brought forward for governor, running against Samuel Young. The disgraced canal commissioner was elected by 17,000 majority. He died suddenly, Feb. 11,1828, while engaged in official duty at Albany. Among his works are, *Discourse before the New York Historical Society; Memoir on the Antiquities of Western New York; Letters on the Natural History and Internal Resources of New York; Speeches to the Legislature*, and many historical and scientific addresses.

CLINTON, GEORGE, 1739–1812; b. N. Y.; youngest son of Charles Clinton. His first noteworthy adventure was connected with privateering in the French war of 1763. He was an officer in the expedition against Fort Frontenac, and after the war went into the law and politics. He was chosen to the colonial assembly and to the continental congress, was made brig.gen. in the revolutionary army, and in 1777 was elected first governor of the state of New York. He was re-elected, and occupied the executive chair in all for 18 successive years, and in 1800 was chosen for one more term, making 21 years as governor. In 1804, he was elected vice-president of the United States, holding the office until his death, as he was re-elected in 1808, when Madison was elected president.

CLINTON, Sir HENRY, 1738–95; grandson of Francis, sixth earl of Lincoln. Sir Henry was a maj.gen. of the British army in the American revolution, was in the battle of Bunker Hill, and took possession of New York after the defeat of Washington's forces in the battle of Long Island, Aug. 26, 1776. In 1778, he succeeded sir William Howe as commander-in-chief. He returned to England in 1782, and in 1793 he was made governor of Gibraltar, where he died.

CLINTON, HENRY FYNES, a very distinguished classical scholar, was b. Jan. 14, 1781, at Gamston, in Nottinghamshire; educated at Southwell school, and afterwards at Westminster. In 1799, he went to Oxford, and in 1805 took his degree of M.A. Next year, he entered parliament as member for Aldborough, which he continued to represent until 1826. He died Oct. 24, 1852. C.'s two great works are the *Fasti Hellenici* (1824–34), and *Fasti Romani* (1845–50). They are known to all European scholars, and contain an immense store of learning.

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CLINTON, JAMES, 1736–1812; b. N. Y.; fourth son of Charles the immigrant, and father of De Witt. He went into the English army, serving as a captain in the French war, distinguishing himself in the capture of Fort Frontenac. In the revolution he took the side of the colonies, and was made brig.gen. He was wounded at the capture of Fort Clinton by the British, but escaped with a part of the garrison across the Hudson river. He was engaged against the Indians in Gen. Sullivan's Iroquois expedition, and was present at the siege of Yorktown and the surrender of Cornwallis, and at the evacuation of New York by the English. He was a delegate to the New York convention which adopted the federal constitution.

CLINTON, CASTLE, was a fort erected by the United States government in 1807, at the southern extremity of Manhattan island (New York City), and designed as a part of a series of defenses on the Hudson. It is a singular looking building, circular in form. In 1823 it was transferred to the city, and, under the name of Castle Garden, was used for a number of years as a place of amusement, opera house, etc. In 1855 it was taken as an office for the reception of immigrants, and was used for this purpose until the close of 1890. It has been converted into a public aquarium.

CLINTON STATE PRISON, in Clinton co., N. Y., in the t. of Dannemora; pop. of township, '90, 3977. The prison comprises a number of buildings inclosed in a stockade which surrounds 37 acres of land. This location was chosen for the purpose of employing convicts in the mining and manufacture of iron, there being abundance of that ore on the tract belonging to the prison, or to the state. It is also in a densely wooded region, and the timber furnishes the charcoal used in the furnaces. The prison was begun in 1844.

CLIO, a genus of shell-less pteropodous mollusks, of which one species, *C. borealis*, is extremely abundant in the Arctic seas, and constitutes a principal part of the food of whales, so that indeed the name *whale's food* is often given to it by whale-fishers. It is scarcely an inch long; the head is furnished with six retractile tentacula; the organs of locomotion are two delicate fins, attached to the neck, and which in swimming are brought almost in contact, first above, then below. It is an active little creature, often coming for an instant to the surface of the water in calm weather, and then suddenly diving away into the depths. Myriads are seen together, and the water is sometimes so full of them that a whale cannot open its mouth without engulfing them in great numbers. *C. australis* is almost as abundant in the southern seas as *C. borealis* in the northern. See illus., MOLLUSKS, vol. X.

CLI'O, in Grecian mythology, the daughter of Jupiter and Mnemosyne, the mother of Hyacinthus and Hymenæus. She was the muse of history and epic poetry, and was represented as bearing a half-opened roll of a book.

CLIPPER, a sailing vessel built with very sharp lines, more or less raking masts, and great spread of canvas, with a view to speed; a development of a model for the mercantile marine, first built in this country at Baltimore, and called the *Baltimore Clipper*. The clippers becoming famous for quick runs, and occasionally making better time than the steamers, were especially employed in the South American trade, in the China trade, for tea and opium, and in the early California trade, via Cape Horn. For many years the fruit-clippers were celebrated for their rapid passages; and the opium-clippers and slavers attained an unenviable notoriety for speed. A clipper ship, as compared with an ordinary sailing ship, is longer, and generally of less beam in proportion to her length; very sharp at the bows, which are hollowed more or less below the water-line; gracefully fined away towards the stern, which is most always elliptical; and, in fact, the comparison of the race-horse to the beast of burden, holds good in comparing the clipper to the ordinary sailing ship. The Aberdeen builders, and Mr. Scott Russell, in England, in later years, have built some of the most magnificent clipper ships that sail the ocean. Among the fastest passages are those made by the *Flying Cloud* in 1851, New York to San Francisco in 89 days and 18 hours, making 374 miles in 1 day; 1854, the *Lightning*, Boston to Liverpool, 2827 miles in 13 days, and Melbourne to Liverpool, 12,190 miles in 64 days; the *Nightingale* in 1865 went to Melbourne from New York, 12,720 miles, in 73 days; the *Thornton*, Sandy Hook to Liverpool, 3000 miles in 13 days, 9 hours; in 1869 the *Golden Gate*, an iron clipper ship, went from Liverpool to San Francisco, 13,800 miles, in 100 days.

CLIPPING THE COIN, See COINING.

CLISTHENES, or CLEISTHENES, an Athenian, grandson of the tyrant Sicyon, who, after the expulsion of Hippias from Athens, took the side of the common people against the would-be tyrant Isagoras, and effected some changes in the constitution which tended to increase the rights and privileges of citizens, his object being to destroy the old aristocracy. He is said to have been the first to introduce the punishment of ostracism, and the first to suffer from it. He was banished by the Athenians, and 700 families of his followers also were sent away; but Isagoras finally failed of his purpose, and Clisthenes and the banished families were recalled.

CLITUMNUS (now CLITUMNO), a small river in Umbria, Italy, celebrated for the clearness of its waters and the beauty of the cattle raised upon its banks. Its source is

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near Spoleto, and after a course of 9 m. it takes the name of Timia. It was once so famous that Caligula, Honorius, and other great people made special visits to its banks. Near the river was a grove of cypresses, and close above the water was a temple to Clitumnus, supposed to be the same now occupied as a Christian chapel. The white cattle peculiar to the valley of the Clitumnus were held in great demand for sacrifices to the gods.

CLITUS, or **CLEITUS**, foster-brother of Alexander the Great, who saved Alexander's life at the battle of Granicus 334 B.C. when, with a blow of his sword, he severed the arm of Spithridates which was stretched out to slay the king. He held high positions in Alexander's armies, and in 328 was made satrap of Bactria; but on the night before he was to leave for his satrapy a feast was given by Alexander in honor of the Dioscuri. Both the king and Clitus became excited with wine, and a wrangle ensued in which Alexander thrust him through with a spear and killed him.

CLIVE, KITTY, comic actress, was born in London in 1711, the daughter of William Raftor, a lawyer from Kilkenny. She came out at Drury Lane about 1728, and chiefly at Drury Lane she continued to play until 1769, when she quitted the stage and retired to Twickenham. About 1731 she had married George Clive, a barrister, but they soon parted. She died at Little Strawberry Hill, 6th December, 1785. Garrick, Handel, Horace Walpole, and Dr. Johnson all liked her, the last remarking to Boswell that "in the sprightliness of humor he had never seen her equalled." And of him she said, "I love to sit by Dr. Johnson; he always entertains me." See her life by Percy Fitzgerald (1888).

CLIVE, ROBERT, Lord, Baron of Plassey, one of the greatest warrior-statesmen of whom England can boast, the founder of British supremacy in India, was b. at Styche, in Shropshire, 1725. At school he exhibited little aptitude for learning, but was noted for his mischievous propensities and his fearless disposition. The monotony of a clerkship in the India Civil Service at Madras, where he arrived in 1744, had literally nearly been the death of him; it was with great joy, therefore, that he abandoned the pen for the sword, when, some three years after his arrival, the troubles accumulating upon the English in India gave him an opportunity of doing so. C. had now found his true sphere. The bold, fearless character had now scope enough for its development; the intellect which, chained to the desk, had seemed of the dullest and most common-place kind, in the freedom of the field became at once quick, comprehensive, and original. When C. grasped the sword, English influence in India was almost extinct; the French and their allies had scarcely left them even a material footing. Yet, in less than a half-a dozen years after, C. had, in Aug., 1751, with 200 English infantry and 300 sepoys, marched out of Fort St. David on his hazardous enterprise to attack Arcot, a city of 100,000 inhabitants, and garrisoned by 1,200 or 1,500 of Chunda Sahib's best troops, amply supplied with artillery, the decisive battle of Plassey had been fought, and English power established on the ruin of that of France and the native princes. The daring displayed in the capture of Arcot, and the intrepidity and fortitude exhibited in its defence by C. and his little band, reduced to 200 men, against an army of 10,000, was the foundation of England's subsequent greatness and glory in India. C.'s name henceforward was a tower of strength in India, where he was surnamed by the natives *Sabat Jung*, or "the Daring in War." Victory marched with him alike against native warriors, French, and Dutch. Unscrupulous as to his means, he would undoubtedly have found himself involved in many difficulties had not his questionable actions been invariably crowned, and thus—in the lax political notions of the time—justified, by success. Nothing remaining for him to do in India, he returned to England in 1760, and received the warm thanks of the company and an Irish peerage from the government for his services. His wealth, arising from shares in various spoils, presents, and grants of territory from native princes, was enormous. After his departure from India, the company's affairs, through the dishonesty of its servants, high and low, fell into a state of the greatest confusion, and C., in 1764, was chosen to set them right. He proved himself as competent an administrator as he was a warrior. Uncompromising and resolute, he bore down every opposition to his plans, all the more sternly that he found it in some cases assuming the form of threats. In less than 18 months, he had "restored perfect order and discipline in both the civil and military services, and brought back prosperity to the well-nigh ruined finances of the company." He returned to England in 1767, and was received with the distinction to which his important services entitled him. But the energetic way in which he had righted matters in India, gave offence to those who suffered from the suppression of dishonest practices, many of whom were not without considerable influence in the mother-country. This influence they employed to stir up ill-feeling against C.; and his proceedings in India were made the subject of animadversion in parliament in 1772, and, in the following year, matter for the inquiry of a select parliamentary committee; who, however, failed to find that C. had acquired his great wealth by abuse of power, as his enemies had asserted. The form of acquittal, however, was not quite satisfactory to C., who never got over the disgrace implied in the trial; and ended his life by suicide, Nov. 22, 1774. See Malleson, *Founders of the Indian Empire: Clive* (1882), and Browning's *Dramatic Idylls* (2d series, 1880).

CLÖA'CA. See the article BIRDS. A similar anatomical arrangement is found in one order of mammals, the monotremata (q.v.) in all reptiles, and in many fishes.

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CLOACA MAX'IMA. This was a subterranean passage of vast extent, by which the whole, or a great part, of the filth of ancient Rome was conveyed to the Tiber. Drains from the lower parts of the city around the forum, and from the other valleys, were commenced by Tarquinius Priscus; but the construction of the C. M. is attributed by Livy to Tarquinius Superbus. Niebuhr is of opinion that it was at first intended to drain the valley of the forum; but it appears to have been subsequently extended, and connected with the smaller cloacæ. Running from the forum past the temple of Vesta, it terminated at the Tiber, where the mouth of it is still visible. It consisted of 3 large arches, one within the other. The space inclosed by the innermost vault was upwards of 13 ft. in width, and of a corresponding height. The arches were built of large blocks of stone, fixed together without cement, of the uniform size of rather more than 5 ft. 5 in. long, and 3 ft. high. The species of stone used bears evidence to the antiquity of the construction, being the material which was employed in the most ancient public edifices. The sewer was kept in a state of efficiency by a continual stream of superfluous water from the aqueducts. Large portions of this and of the other cloacæ remain, in some places still visible, but generally buried, by the accumulation of soil, at a considerable depth below the present level of the streets. During the republic, the surveillance of the Roman cloacæ was one of the duties performed by the censors. The C. M. was subjected to repair by Cato and his colleague in the censorship. Agrippa, when ædile, obtained praise for his exertions in cleansing and repairing the cloacæ, and is recorded to have passed through them in a boat. Under the empire, officers called *curatores cloacarum urbis* were appointed for their supervision. So thoroughly was the city undermined by these large sewers, that Pliny calls it *urbs pensilis*, a city suspended in the air rather than resting upon the earth. Drains of the same description, but of smaller dimensions, existed in some others of the ancient Roman cities.

CLOACI'NA, in Roman mythology, the goddess of sewers, mentioned in very early times. Pliny derives the name from a verb which meant to wash or purify. See CLOACA MAXIMA.

CLOCK BELL-METAL is principally an alloy of copper and tin with smaller quantities of bismuth, antimony, lead, and zinc. A common alloy is 80 parts of copper, 10 tin, 5½ zinc, and 4½ lead. The bismuth and antimony make the bell more brittle, but they communicate a better tone; and where the proportion of tin rises as high as 20 per cent., or 1 part of tin to 4 of the other metals, a very much more sonorous bell is obtained.

CLOCKS, CURIOUS. Among remarkable clocks, one of the best known is that in the Strasbourg cathedral. Another, illustrating the elaborateness to which clock-work is sometimes carried, was placed on exhibition in New York in the summer of 1880. It is the work of Felix Meier, who spent more than 10 years on its construction. It is 18 ft. high, 8 wide, and 5 deep. It has 2,000 wheels, runs by 700-lb. weights, and is wound up once in 12 days. Above the main body of the clock is a marble dome, upon which Washington sits in his chair of state, protected by a canopy which is surmounted by a gilded statue of Columbia; on either side of Washington is a servant in livery, guarding the doors, which open between the pillars that support the canopy; on the four corners of the main body of the clock are black walnut niches; one of the niches contains the figure of an infant, the second the figure of a youth, the third of a man in middle life, the fourth of an aged graybeard, and still another, directly over the center, contains a skeleton, representing father Time. All of these figures have bells and hammers in their hands The infant's bell is small and sweet-toned; the youth's bell larger and harsher; the bell of manhood strong and resonant; that of old age diminishing in strength, and the bell of the skeleton deep and sad. A figure of William C. Bryant, and another of Prof. Morse rest upon the pillars that support the planetary system. The astronomical and mathematical calculation, if kept up, would show the correct movement of the planets for 200 years, leap years included. When the clock is in operation it shows local time in hours, minutes, and seconds; the difference in time at Chicago, Washington, San Francisco, Melbourne, Pekin, Cairo, Constantinople, St. Petersburg, Vienna, London, Berlin, and Paris; the day of the week, calendar day of the month, month of the year, and seasons of the year, the signs of the zodiac, the revolutions of the earth on its own axis, and also around the sun; the revolutions of the moon around the earth, and with it around the sun; also, the moon's changes from the quarter to half, three-quarters, and full; the correct movement of the planets around the sun, comprising Mercury, which makes the revolution once in 88 days; Venus, once in 224 days; Mars, once in 686 days; Vesta, once in 1,327 days; Juno, once in 1,593 days; Ceres, once in 1,681 days; Jupiter, once in 4,332 days; Saturn, once in 10,758 days; Uranus, once in 30,688 days. There is, therefore, a movement in this wonderful piece of machinery which cannot regularly be repeated more than once in 84 years. But the inventor has a crank attachment to the clock, by means of which he can hasten the working of the machinery, in order to show its movements to the public. By turning continuously 12 hours a day, for 16 days and 8 hours, a perfect revolution of the planet Uranus around the sun would be made. At the end of every quarter hour the infant in his carved niche strikes with a tiny hammer upon the bell which he holds in his hand. At the end of each half hour the youth strikes; at the end of three-quarters

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of an hour the man, and at the end of each hour the graybeard, death then follows with a measured stroke to toll the hour. A large music box, manufactured at Geneva expressly for this clock, begins to play at the same time that the skeleton strikes the hour, and a surprising scene is enacted upon the platform beneath the canopy. Washington slowly rises from his chair to his feet, extending his right hand, presenting the declaration of independence; the door on the left is opened by the servant, admitting all the presidents from Washington's time, including President Hayes. Each president is dressed in the costume of his time. Passing in file before Washington, they face and raise their hands as they approach him, and walking naturally across the platform disappear through the opposite door, which is promptly closed behind them by the second servant. Washington retires into his chair, and all is quiet, save the measured tick of the huge pendulum, and the ringing of the quarter hours, until another hour has passed.

CLOCKS. See HOROLOGY.

CLODIUS PULCHER, PUBLIUS (real name, PUBLIUS CLAUDIUS PULCHER), appears in history, 70 B.C., serving under Lucullus in Asia, and in civil affairs in 69, when he impeached Catiline for extortion in Africa; but Catiline bribed the accuser and escaped. Clodius appears to have been avaricious and unscrupulous. Near the close of the year 62, Clodius was said to have had an intrigue with Pompeia, wife of Julius Cæsar, on the occasion of the celebration of the Bona Dea in Cæsar's house. Clodius was tried for violation of the sacred mysteries, but was acquitted, it was charged because he had bribed the judge. He was elected tribune in 59, and one of his first acts was to exile Cicero, who had refused to defend him in the trial for sacrilege, but the great orator was soon afterwards recalled in spite of Clodius's opposition. He went on from bad to worse, gathering around him the worst elements of the people, until he became a candidate for the prætorship (53 B.C.) in opposition to Milo. Both candidates worked with the energy and recklessness supposed to be characteristic only of modern times. The contest was ended in an unexpected manner, Jan. 20, 52 B.C. Milo set out on a journey to Lanuvium. On the way he met Clodius, who was on his road to Rome. Both were accompanied by armed followers, but passed each other without disturbance. However, some of the men in the rear guard of each party began to quarrel, a fight followed, and Clodius was killed. See CÆSAR, CICERO, MILO.

CLOG AL'MANAC, the name given in England to a primitive kind of calendar or almanac, called also a "rim stock" and "prime staff." In Scandinavia it was called a "Runic staff," from the Runic characters used in its numerical notation. It was generally of wood (whence its name of "clog," *i.e.*, log or block), but was sometimes of brass, of bone, or of horn. When of wood, it was most commonly of box; but elm, fir, and oak, were also employed. "This almanac" says Dr. Plot, in his *Natural History of Staffordshire*, written in 1686, when it was still in use among the common people of that county—"is usually a square piece of wood, containing three months on each of the four edges. The number of days in them are expressed by notches; the first day by a notch with a patulous stroke turned up from it, and every seventh by a large-sized notch. Over against many of the notches are placed on the left hand several marks or symbols, denoting the golden number or cycle of the moon. The festivals are marked by symbols of the several saints issuing from the notches. Some are perfect, containing the dominical letters as well as the prime and marks for the feast, engraven upon them, and such are our primestaves in the museum at Oxford; others imperfect, having only the prime and the immovable feasts on them, and such are all those I met with in Staffordshire; which yet are of two kinds also, some public, of a larger size, which hang commonly here at one end of the mantle-tree of their chimneys, for the use of the whole family; and others private, of a smaller size, which they carry in their pockets." Examples of the C. A. may be seen in the British museum (one cut apparently towards the end of the 17th c.); in the Ashmolean museum, and the Bodleian library, at Oxford; in St. John's college, Cambridge; and in the Cheetham library, at Manchester. The Flemish antiquary, Gruter, delineates one at Rome, which he believes to have been used by the Goths and Vandals; but there is no reason to suppose that the C. A. was known to any European nation before its conversion to Christianity. It is described by the Swedish historian, Olaus Magnus, in the 16th c.; and by the Danish antiquary, Olaus Wormius, in the 17th c. It has been found in France and elsewhere. In Denmark it seems to have been generally flat, divided into six columns; but six-sided examples are not unfrequent. Some of the clog almanacs show a peculiar numerical notation. The first four digits are marked by dots; the fifth, by a sign like the Roman numeral V; the next four, by this sign and additional dots; and the tenth, by the sign +.

CLOGHEEN', a t. in the s.w. of Tipperary co., 14 m. w.s.w. of Clonmel, in lat. 52° 17′ N., and long. 7° 57′ W. Pop. '71, 3,176. The rich limestone soil of Tar vale produces fine wheat crops, and there are extensive flour-mills here. Six m. n.w. of C. are the famous limestone caves of Mitchellstown, with beautiful limestone concretions. The caves consist of galleries and vaults, 800 by 570 feet. Pop. '81, 2924.

CLOGH'ER, a decayed episcopal city of Ireland, in the south of Tyrone, on the Launy, a tributary of the Blackwater, 104 m. n.n.w. of Dublin.

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CLOGS are heavy wooden shoes or, sometimes, shoes with wooden soles and thick leather uppers. They are worn mostly by the peasantry of Europe.

CLOISSONÉ. See ENAMEL.

CLOISTER (Fr. *cloître, claustrum*, an enclosure), a covered passage, or ambulatory, running round the walls of certain portions of monastic and collegiate buildings. The C. usually surrounded, or ran along three sides of a quadrangular area, which was called the *C. garth*. The roof of the C., which was often vaulted, was supported on the side next to the quadrangle by pillars and arches, which were frequently ornamentally combined like trifolial arches, and, like them, occupied by tracery. The upper portions of these arches above the mullions were often glazed; and sometimes latterly even the whole arches, so that they became a row of windows, as at Gloucester. Cloisters were used for exercise and recreation by the inmates of the religious houses. Occasionally, when wholly glazed, they had cells or stalls for study on the inner side; and very frequently a stone-bench may still be seen, which runs along the same side. Many of the larger monasteries had more cloisters than one; and so characteristic were they of the religious houses, that the term C. came to be used in a general sense for the whole establishment, which is still the sense of the word *kloster* in German. See MONASTERY. For type, see illus., ROME, vol. XII.

CLONAKILTY, a t. in the south of Cork co., Ireland, at the head of a small inlet, 26 m. s.w. of Cork. Its chief export is grain. Pop. '91, about 3500.

CLONES, a market t. of Ireland, in the co. of Monaghan, 12 m. w. from the t. of that name. It is situated on a rising ground on the high-road between Monaghan and Belturbet, and near the Ulster canal, and is in general well built, and has some ancient remains, including the ruins of a monastery, dating, it is said, from the 5th c., and of a round tower. It is an important railway junction. Pop. '91, about 2500.

CLONMEL' (Vale of Honey), a parliamentary and municipal borough in the s. of Tipperary co., with a little in Waterford, on both banks of the Suir, and two islands, 14 m. s.s.e. of Cashel. It chiefly stands on the Tipperary side of the Suir, and on one of the isles in the river. One of the bridges over the Suir has 20 arches. The main street is a mile long, and parallel to the river. Pop. '71, 10,112, of whom 8,729 were Roman Catholics, 1,119 Protestant Episcopalians, and the rest of other denominations. C. returns one member to parliament. Among its industries are flour-milling, brewing and tanning. The chief exports are agricultural produce and cattle. Barges of 20 to 50 tons ply on the Suir to Waterford. C. had formerly walls, of which one gate remains. In 1650 Cromwell besieged the town, and demolished the castle. C. gave birth to Sterne and Lady Blessington, and was the chief scene of O'Brien's attempted rising in 1848. Here Mr. Bianconi first established the cheap and rapid car traveling over the southwest of Ireland; and C. is now a great center for Irish tourists. Pop. '91, 8480.

CLONTARF', a t. of Ireland, in the co. of Dublin, about 3 m. e.n.e. of Dublin city. It is much frequented during the summer months for sea-bathing, and there are many handsome villas in the vicinity. C. is celebrated in history as the place where, in 1014, Brian Boroimhe (q. v.) won a great victory over the Danes. Pop. about 3000.

CLOOTS, JEAN BAPTISTE, Baron, better known as Anacharsis Cloots, was perhaps the most singular of all the enthusiasts brought to the surface of society by the French revolution. He was born near Cleves in 1755, and from his 11th year was educated in Paris. Through ardent study of the ancients, his imagination, naturally extravagant, became so heated with the political constitutions of Greece, that he undertook the mission of spreading the democracy of Sparta and Athens throughout the world; and with this view he traveled through most of the countries of Europe, under the name of Anacharsis, everywhere expending upon his philanthropic schemes large sums of his very considerable private fortune. The union of all nations in one family was the ultimate aim of all his cosmopolitan schemes. The breaking out of the French revolution brought his enthusiasm to a head, as he saw in it the fulfillment of his dreams and plans. He returned to Paris, constituted himself the "orator or advocate of the human race," and presented numerous petitions to the national assembly. On the 19th of June, 1790, he appeared at the bar of the assembly at the head of a number of strangers, dressed in the costumes of different nations, as the representatives of the whole earth, and presented an address of thanks for the stand made against the tyrants of the world, and a request that all the strangers then in Paris should be made French citizens. As a member of the constituent assembly, he offered to raise a Prussian corps, to be called the vandal legion; proposed to lay a price on the head of the duke of Brunswick; called the king of Prussia the Sardanapalus of the north; and eulogized count Ankarström for having assassinated the king of Sweden. What is singular is, that these extravagances were received often with storms of applause. He called for the apotheosis of Gutenberg in the Pantheon, as the "creator of the word," and also for that of an apostate priest. On the occasion of the general armament of France, he deposited 12,000 francs on the altar of the country. In 1792, he was elected a member of the convention, and continued to weary the house with his extravagant motions. He hated Christianity no less than royalty; declared himself the enemy of its founder; and, as an adherent of the worship of reason, preached downright materialism. At the trial of Louis XVI. he gave his vote for death "in the name of the human race," and took occasion at the same time to pass

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sentence on the king of Prussia. Some time after, on the motion of Robespierre, he was excluded from the club of the Jacobins, on the ground that he was wealthy and a nobleman. Robespierre hated and feared the enthusiast; and when St. Just brought his impeachment against Hebert and his adherents, C. was involved in it, and was condemned to death, and executed Mar. 23, 1794. He heard his sentence with the greatest composure, comforted the companions of his fate, and continued to preach materialism to his friend Hebert on the way to the place of execution. At the foot of the scaffold, he requested that his turn might be last, in order that he might have time to establish a few more principles, while the heads of the others were falling. He then laid his head with equanimity on the block, after asserting his innocence, and protesting against his sentence, "in the name of the human race." He left a number of writings, all of the same extravagant character, of which we may mention here *Certitude des Preuves du Mohammédisme* (Lond. 1780); *L'Orateur du Genre Humain* (1791); and *Base Constitutionale de la Republique du Genre Humain* (1793).

CLOQUET, JULES GERMAIN, b. 1790; brother of Hippolyte, and also a physician and surgeon; eminent especially in the latter science. He was for many years professor of surgery in the faculty of Paris. Among his works are one on the human anatomy, in three volumes, profusely illustrated; others are on hernia, on calculi, and diseases of the urinary organs; on the preparation of skeletons, on the lachrymal apparatus in serpents, and on the anatomy of intestinal worms. He made many new surgical instruments, and invented improved methods of performing operations. In 1860, he received the cross of the legion of honor, and in 1867 was made a baron. He d. 1883.

CLOSE, in heraldry. When the wings of a bird are down and close to the body, it is described as close. The term is used only with reference to birds addicted to flight.

CLOSE is a small space enclosed by a wall or fence; a narrow side street, or passage leading to a court; in England the precincts of a cathedral.

CLOSE'-HAULED, in seamanship, is the mode in which the sails are arranged, in order to make the ship move in a direction the nearest possible towards that point of the compass from which the wind blows. Fore-and-aft vessels, especially cutters, sail closer to the wind than square-rigged ones. Ships of some sizes and shapes can attain this result better than others; but it is a quality scarcely to be calculated beforehand.

CLOSE TIME. A portion of the year during which it is forbidden to kill game or fish while breeding.

CLOSET, in heraldry, the half of the bar (q.v.).

CLOSSE, RAPHAEL LAMBERT, 1620–62; a Canadian pioneer famous for fighting Indians. He came from France in 1642, and was made serg. maj. of the garrison at Montreal. He had many severe contests with the aborigines, on one occasion engaging 300 Iroquois with only 34 men, killing 50 and wounding 37 of them, with the loss of only one man killed and one wounded. In 1655 he acted as governor of Montreal. He was killed in a fight with Indians in 1662.

CLOSURE. See CLOTURE.

CLOTAIRE I. AND II., Kings of the Franks. See MEROVINGIANS.

CLOTHES-MOTH, a name common to a number of species of small moths of the genus *tinea*, the larvæ or caterpillars of which are extremely destructive to woolen clothes, furs, stuffed quadrupeds and birds, etc. *Tinea destructor* is one of the most annoying of these insect pests. It is of a satiny buff color, the wings deflexed when at rest. The larva is about a quarter of an inch long, with only a few hairs, white, with a slate-colored line down the back, an ocherous head, and 16 legs. *T. tapezana* has the upper wings black at the base, the rest of the wing white. *T. sarcitella* is another very common species of a silky gray color; the head, thorax, and base of the superior wings white; the wings folded flat on the back when at rest. The larva is covered with scattered hairs. These moths are most abundant in the warmer seasons of the year, but their larvæ carry on their destructive operations even during winter. Guided by instinct, the female moth lays her eggs where the larvæ may find their appropriate food, consisting of substances indigestible to almost every other creature; and the larvæ being furnished with minute but strong and sharp jaws, not only begin to eat as soon as they are hatched, but to cut the fibers of the substances on which they feed into little bits, and to unite them by means of a glutinous silk of their own producing, so as to form for themselves cases, lined internally with silk; and in these they constantly abide, adding to them at the anterior end as their own increase of size requires, and also widening them, by slitting them down the middle, and mending them with additional materials. All this may be beautifully observed by transferring the same moth-larva to different pieces of flannel in succession, of different colors. The larva of *tinea tapezana* works its way through woolen stuffs in an arched gallery, carrying its little case with it. *T. pellionella* makes similar tunnels in furs. *T. granella* is destructive to books as well as to grain. See CORN-MOTH. The best means of preventing the ravages of moths are perfect cleanliness, frequent inspection of articles, and their exposure to light and air. Spirit of turpentine is used for killing them; the vapor arising from a sponge dipped in this liquid is fatal to such as it sufficiently reaches; they are also killed by the heat of a brisk fire or of an oven.

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CLOTHING, ARMY. The regulations and decisions pertaining to the uniform of the army of the United States, published by authority of the Secretary of War, contain detailed instructions as to the clothing to be worn by every officer and enlisted man on all occasions. Full dress and undress uniform for all officers, insignia, shoulder straps, buttons, etc., are so ordered as to indicate the rank of the wearer. The horse furniture of mounted officers is prescribed also. All the uniforms of the regular army, except those of chaplains, have dark blue double-breasted frock coats with buttons of gold or yellow metal. The chaplain wears a black frock coat with black buttons. In extreme southern latitudes in summer, and for troops not attached to any military department, a suit of sack coat and trousers of cotton duck are allowed, and provision is made for a suit of brown cotton duck fatigue clothing. There is no particular pattern as uniform for boots and shoes. Fur overcoats are supplied to troops stationed in cold climates. The badge of military mourning is a piece of black crape worn for thirty days around the left arm above the elbow.

CLO'THO, a genus of spiders, of which the only known species, *C. quinquemaculata*, a native of the s. of Europe and n. of Africa—about half an inch long, long-legged, brown, with black abdomen, marked with five yellowish spots—is interesting on account of its habits and the sort of tent which it spins for itself. This curious structure is in shape like a limpet shell, about an inch in diameter, and is fastened to the under side of stones or in crevices of rocks, not by its whole circumference, but by seven or eight points only. Within this the eggs are deposited in several bags of lenticular form. The parent creeps in and out under the edges of her tent, and supplies the young with food for some time.

CLOTHO, one of the three Moiræ, Parcæ, or Fates; daughter of Erebus and Nox, or of Jupiter and Themis. She was the youngest of the dreaded sisters, and her symbol was a distaff, from which she was supposed to spin the threads of mortal life. By some she is represented in a parti-colored robe, wearing a crown with seven points or stars.

CLOTILDA, SAINT, 475–545; a daughter of Chilperic, king of Burgundy, and wife of Clovis, king of the Franks. Her father, mother and brothers were murdered by Gundebald, her uncle, but he spared and educated her. He opposed her marriage with Clovis, but she eluded him and was wedded, and converted the Frank king to the Roman Catholic religion in 496. He avenged the murder of her family, and made Gundebald his tributary. After the death of Clovis, Clotilda persuaded her sons to renew the quarrel, and a war followed which ended with the union of Burgundy to the Frankish empire. Clotilda then retired to Tours, and practiced the austerities of a devotee until her death. She was buried in the church of St. Genevieve, which her husband had built in Paris, and was canonized a few years afterwards. During the revolution a devout abbe, fearing that her remains might be desecrated, had them exhumed and burnt, and the ashes are now in an urn in the church of St. Leu. There is a statue of her in the Luxembourg, and a fine church in her honor was built in Paris a few years ago.

CLOTURE: the sudden stoppage of debate in parliamentary assemblies by the decision of the speaker, or chairman, or by a vote of a majority of the legislators. It is designed to cut off the unreasonable or vexatious obstruction of the minority, and to bring the main question to a direct vote. The C. came into prominence in the English house of Commons, 1881. During the sessions of 1877–79, the "home rulers," determined to obstruct legislation, offered hundreds of amendments, called for the ayes and noes on every question, and retarded business in many ways. In 1881, the same policy was adopted during the discussion on Mr. Gladstone's "coercion bills" for Ireland; and although parliament had been convoked a month earlier than usual in order to hasten much-needed legislation, the obstructionists rendered the efforts of the house futile. The speaker at last made known his intention to refuse recognition to any more speakers; and Mr. Gladstone offered a motion which provided for an immediate vote upon any matter of urgent business, at the request of 40 members, and at the sacrifice of the usual privileges of debate. This motion was passed by a great majority, amid the wildest confusion, during which ten Irish members were forcibly expelled from the house. The C. has been in vogue in France since the *coup d'état* of 1851. Five members may move for it; the motion is then put from the chair, and only one member may speak in opposition; if the majority sustain the motion it is voted upon immediately. In the American House of Representatives, a debate may be terminated by the parliamentary device of moving the "previous question" (q.v.). In the Senate, however, there is no limitation to debate, each Senator being allowed to consume all the time that he desires. In 1891, an attempt was made to secure the adoption of new rules that would allow the "previous question," as in the House, but the established traditions of the Senate were upheld by a majority of the members.

CLOUD, a co. in n. Kansas on Republican and Solomon rivers; 720 sq.m.; pop. '90, 19,295. The productions are almost entirely agricultural. Co. seat, Concordia.

CLOUD, ST., a t. of France, in the department of Seine-et-Oise, situated on the declivity of a hill near the Seine, 5 m. w. of Paris. Its present name is said to be a corruption of St. Clodoald, the name of a grandson of Clovis, who retreated to the little

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village of Novigentum, to escape the fury of his uncle, Clotaire, and became a monk. After his death, the village took the name of the pious prince, whose relics were sacredly preserved, and whose tomb was the scene of many miracles. St. C. figures often in the wars of the middle ages. Henry III. was assassinated here in 1589, by the fanatical monk Jacques Clement. St. C. was long famous on account of its magnificent château, built by Mazarin, and embellished by successive dukes of Orleans, who possessed it till 1782, when it passed into the hands of Marie Antoinette. Here Bonaparte, in 1799, was named first consul; and in this place Charles X. signed the ordinances which produced the revolution of 1830. But during the siege of Paris, on the 13th Oct., 1870, the château was set on fire and almost entirely destroyed by the French artillery from mont Valerien; apparently because it was supposed to be the head-quarters of the German staff. Pop. 5000.

CLOUDBERRY, *Rubus chamæmorus*, a plant of the same genus with the bramble, although of very different appearance, having a herbaceous single-flowered stem destitute of prickles. The plant is of humble growth, 8 to 10 in. in height; the leaves few, large, lobed, and somewhat kidney-shaped; the flower large and white, male and female flowers on separate plants, the female plant producing an orange-red fruit equal in size to a bramble-berry, and of an agreeable flavor. It is a native of the northern parts of Europe, Asia, and America. In Britain, it is chiefly confined to elevated moors; in Norway and Sweden, it is much more abundant, and the fruit is highly valued and made into excellent preserves. Unfortunately, the plant is of difficult cultivation, and no attempt to make it produce fruit freely in our gardens has yet been successful.—Somewhat similar to the C. is *rubus geoides*, which yields a very agreeable fruit as large as a raspberry, one of the few native fruits of Terra del Fuego and the Falkland islands.

CLOUDS are masses of fog, consisting of minute particles of water, often in a frozen state, floating in the atmosphere. When air saturated, or nearly so, with vapor, has its temperature lowered, either by ascending and becoming rarer, or by meeting a colder current, a portion of the vapor loses its gaseous form, and becomes condensed into minute specks of water. See EVAPORATION, DEW, RAIN, SNOW-LINE. A cloud, therefore, does not consist of vapor, in the proper sense of the word, but of water in the form of dust, as it were. How this water-dust is suspended in the atmosphere—why the particles do not descend as soon as formed, has never been satisfactorily explained. It has been assumed that the watery particles are hollow, like blown bubbles. But there is no proof of this; nor would the hollowness of the particles account for their floating, unless it could be shown that they must be filled with a gas lighter than the surrounding air. Prof. G. G. Stokes holds that they are prevented from falling mainly by the friction and drag of the air-particles, just as fine powders remain suspended in liquids of much less specific gravity than themselves. But, as sir J. Herschel says, rising and horizontal air-currents must also oppose the fall of C.; for at night, in the absence of rising currents, they often descend to and dissolve in lower and warmer levels. The conditions under which C. are formed, and afterwards deposited in rain, are more fully considered under EVAPORATION, DEW, RAIN, SNOW-LINE. The present article is confined to a description of the various kinds of C., and of the weather they indicate.

A general haze of precipitated vapor covering the sky, and coming down to the earth is termed a *fog* or *mist;* and the term cloud is usually confined to masses of fog floating in the higher regions, and not descending to the ground. They are mostly within a mile of the earth's surface; and none are more than 5 or 6 m. above it. They rise higher in the equatorial regions than towards the poles. C. spread and move with the wind in varied, often grand forms; they are generally disposed in beds parallel to the earth's surface; vertical C. occur rarely, if at all.

Mr. Luke Howard's classification of C., proposed in 1802, into three primary forms —cirrus (Ci.), cumulus (Cu.), and stratus (St.); three intermediate—cirro-cumulus (Ci.-cu.), cirro-stratus (Ci.-st.), and cumulo-stratus (Cu.-st.); and one compound form, nimbus (Ni.) —has been universally adopted, and holds good in all climates and atmospheric conditions.

Cirrus, or curl cloud, consists of parallel, curling, flexuous, diverging, and partly straight fibers, increasing in any or in all directions by elongation, branching, or addition of new fibers. It is the highest and least dense of C.; forms at least 3 m. above the earth; varies most in extent, direction, and shape; retains longest its varied outlines; and is the longest illuminated after sunset and before sunrise. It resembles a mare's or cat's tail, a lock of hair, fine trellis-work, or thin silvery streaks, and it may cover all the sky. Cirri seem to arise from the mixing of parallel air-currents, or are the relics of dissolving clouds drawn out in fibers by wind. Threads and groups of Ci., during gentle wind after severe weather, presage serene settled weather. But after a long tract of fair days, whitish filaments or parallel bands of Ci. crossing the sky, with the ends converging by perspective in each horizon, and traveling longitudinally, though seemingly stationary, foretell a change to wet. Ci., being so high, must consist of minute snow crystals, whose refractions and reflections produce the halos, coronæ, and mock suns

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and moons almost restricted to this cloud and its derivatives the Ci.-st. and Ci.-cu. The fibers often wave back and fore, or to and from each other. Ci., especially with fine tails, varying much in a few hours, presage rain or snow, and windy variable weather.

Cumulus, ball of cotton, day or summer cloud, consists of dense, convex, hemispherical, or conical heaps of small roundish C., piled or stacked on each other. The heaps enlarge upwards from a horizontal base, and have crenated tops; they sometimes unite into stupendous white-topped mountains. It forms, says sir J. Herschel, in summer calms by the rise of columns of vapor from marshes, lakes, and rivers, into the colder and quickly saturable lower regions of the air; for one liquid traverses another in cylinders. Cumuli begin after sunrise as a few scattered specks in the clear sky; these specks enlarge and unite to form C., which often nearly cover the sky in the afternoon, and generally decrease and vanish about sunset; but rain follows if they increase in number and darkness in the evening. Their tops become Ci. in very dry air. Cu., of pleasing forms, dispositions, and colors, and of moderate size, presage fine dry warm and calm days; but cold, rain, and tempest follow dark, abrupt, dense, shaggy Cu., covering the sky, and rolling on each other. Hemispherical silvery white Cu. presage thunder.

Stratus, fall or night-cloud, the lowest of C., is a widely extended, horizontal sheet, of varied thickness, of white mist touching or near the earth. In density it is between Ci. and Cu., and it increases from below. It is common in summer and autumn often from sunset to sunrise, and is densest at or after midnight. It arises in calm clear evenings, after warm days; from the cooling of moist air on damp ground, marshes, lakes, rivers, or from the cooling of moist air mixed with smoke enveloping great cities. From a height, it is seen spreading around like a sea, and creeping up hillsides. After sunrise, it rises from the ground, breaks up into Cu., and vanishes with the increasing heat, to be followed by a serene day; but it may quietly accumulate in layers, and become a Ni. It does not wet objects it touches, and thus differs from a variety of Ci.-st. of like external aspect.

Cirro-cumulus, or sonder-cloud, consists of Ci. sinking in the air, and compressed into dense roundish-white cloudlets, or woolly irregular tufts, generally at great heights. It often forms a beautiful sky in beds like flocks of sheep at rest. It is often seen through breaks in lower C., moving differently. It may vanish or pass into Ci. or Ci.-st. Solar and lunar coronæ appear in it. It occurs in warm dry weather, and between summer showers, and presages increased heat. Ci.-cu. very dense, round, and close, and with Cu.-st., presages a storm or thunder. In winter, it precedes a thaw and warm wet weather.

Cirro-stratus, or vane-cloud, consists of long, thin, horizontal clouds, with bent, or undulated edges. It often resembles shoals of fish, or has a barred appearance—the mackerel-backed sky. It alone, or with Ci.-cu., forebodes rain, snow, and storm. Waved Ci.-st. generally attends heat and thunder; it often forms an extended shallow bed or thin veil, through which the sun and moon shine faintly. This variety oftenest presents the finest solar and lunar halos, parhelias and paraselenes, and it is the surest prognostic of rain and snow.

Cumulo-stratus, or twain-cloud, is a Ci.-st. mixed with Cu. heaps, or a wide flat base surmounted by a bulky Cu., with fleecy protuberances or rocky and mountain masses. It resembles a thick-stemmed fungus, with a flat, anvil-shaped, or cirrose top. It is much denser than Cu., though the air is not dry enough to round off sharply its tops. It often forms vast banks of cloud, with overhanging masses. It is common towards night in dry windy weather, when it has a leaden hue. It generally arises from Cu. becoming denser, wider, and protruding in large irregular projections over the base. It tends to overspread the sky, and partly or wholly to become Ni., and to fall in showers. Cu.-st. is intermediate between clouds indicating fair, and those indicating rough, rainy weather, and attends sudden atmospheric changes. Distinct Cu.-st. forms before thunder. Cu.-st. increases the grandeur of mountain scenery, and drops on and envelops mountain-tops like a curtain.

Nimbus, or cumulo-cirro-stratus, the black rain-cloud, is a cloud or mixed system of clouds, ending in showers of rain, snow, or hail. It is a dense, continuous, horizontal black or gray sheet, with fringed edges, a cap of Ci., and Cu. on the sides and below. Before rain, vast towering masses of Cu. often pass into Cu.-st., which, increasing in density, darkness, irregularity, and extent, become Ni. capped by Ci.-st. Thunderstorms are always accompanied by ni. in its most perfect form.

The term *scud* has been applied to loose vapory fragments of C. driven by wind, and *cumulonus* to shaggy cumuli.

The formation and height of C. vary with the quantity of vapor in the air, the course and height of air-currents, the climate, season, temperature, disposition, and extent of sea and land, and the height of land. Cloud-strata on the Pyrenees vary in average thickness from 1600 to 3,400 feet. The lower surfaces of considerable masses of clouds in all climates are probably 2,500 to 3,000 ft. above the earth. Remarkable cloud-rings prevail over the calm zones of the equator, and over those of Cancer and Capricorn. Clouds, viewed from above in bright sunshine by the aëronaut or mountaineer, appear as dense volumes of steam or masses of white cotton. Kaemtz regards the usual height of Ci. as 10,000 to 24,000 ft.; Cu., 3,000 to 10,000; Ni., 1500 to 5,000; but Ci. may descend to 2,000 or 3,000 ft., and Ni. to within a few hundred ft. of the earth.

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C. moderate the sun's rays during day, and the earth's radiation during night. They always exhibit positive or negative electricity, but of greatest tension in thunder-storms. They are the sources of the moisture required by plants; of the water of springs, lakes, and rivers; and of the polar, glacial, and winter snows, which cover temporarily or permanently parts of the earth.

In Britain, six or seven tenths of the sky is on an average daily obscured by clouds. There is most cloud in winter, and about midday, and least in May or June, and during night. Summer and autumn nights are freest of clouds. All the forms of C. may be seen in one day, often very much commingled.

For some years past the above classification, which was adopted 95 years ago, has been regarded as inadequate for identification and record, and the increasing attention given to clouds as signs for forecasting the weather has led to the adoption by the Hydrographic Office of several new terms in addition to the old classification. The additional forms of clouds named are *alto-stratus* (A.-St.); *fracto-stratus* (Fr.-St.); *alto-cumulus* (A.-Cu.); *fracto-cumulus* (Fr.-Cu.), and *mammato-cumulus* (M. Cu.).

Alto-Stratus. This designation has been given to those thick sheets of grayish or bluish coloring that show very brilliant patches in the neighborhood of the sun and moon, and which, without causing halos, often give fine coronae. This form goes through all the changes like the cirro-stratus, but actual measurements show that its altitude is one-half less.

Fracto-Stratus. Horizontal sheets of lifted fog often place themselves in strata, and when broken up into irregular shreds by the wind or by the summit of mountains they are distinguished by the recently adopted name of fracto-stratus.

Alto-Cumulus. This name is given to rather large globular masses of a white or grayish color, also arranged in groups or lines, and often so closely packed that their edges appear confused. The detached masses are generally larger and more compact at the center of the group, and sometimes change to the strato-cumulus form tapered off to the finer flakes of cirro-cumulus at the margin. They are frequently spread out in lines.

Fracto-Cumulus and *Mammato-Cumulus.* The cumulus clouds are often broken up by strong winds, when they are called fracto-cumulus. When they present a mammillated lower surface they are known as mammato-cumulus. For information in regard to the new classification of clouds, see *Illustrative Cloud Forms*, published by the U. S. Hydrographic Office in May, 1897.

CLOUDY BAY. See NEW ZEALAND.

CLOUGH, ARTHUR HUGH, 1819-61; the son of a cotton trader of Liverpool, who emigrated to Charleston in 1823. The boy went back to England in 1828, and was educated at Rugby and Oxford, becoming a tutor in Oriel college. He resigned in 1848, and in 1852 visited the United States, where he made the acquaintance of Emerson, Longfellow, and other literary men. On his return the next year, he was appointed examiner in the education office of the privy council. Afterwards he traveled in Europe, and was on a tour in Italy when he died suddenly of a fever. His poems are his principal works. He revised Dryden's translation of Plutarch's *Lives*, and wrote a series of tales in verse under the title *Mari Magno*.

CLOUTED or CLOTTED CREAM is obtained by heating milk in a shallow wide pan on a hot plate or over a slow charcoal fire. The milk must be strained, as soon as it comes from the cow, into the pan, where it must stand for 24 hours before heating. It usually takes from half an hour to three quarters of an hour to heat the milk completely; but it must not boil. It then stands for 24 hours, when the cream is skimmed off, and a little sugar thrown on the top. The result is C. C., which, mixed with new milk, is eaten with strawberries, raspberries, tarts, etc. Devonshire is famous for its clouted cream.

CLOVE-BARK, another name for culilawan bark (q.v.).—Another bark which occurs in commerce under the name of C. B. is that of the *myrtus caryophyllata*, a native of Ceylon and the Mascarene isles. It is in sticks 2 ft. long, formed of several pieces of very thin and hard bark, rolled up one over the other, of a deep brown color, and of a taste similar to that of cloves. It possesses properties analogous to those of cinnamon.

CLOVER, or TRE'FOIL, *Trifolium*, a genus of plants of the natural order *leguminosæ*, sub-order *papilionaceæ*, containing a great number of species, natives chiefly of temperate climates, abounding most of all in Europe, and some of them very important in agriculture as affording pasturage and fodder for cattle. The name C. is indeed popularly extended to many plants not included in this genus, but belonging to the same natural order, and agreeing with it in having the leaves formed of three leaflets, particularly to those of them which are cultivated for the same purposes, and sometimes collectively receive from farmers the very incorrect designation of *artificial grasses*, in contradistinction to *natural grasses*, i.e., true grasses. See MEDICK and MELILOT. The true clovers (*trifolium*) have herbaceous, not twining stems; roundish heads or oblong spikes of small flowers; the corolla remaining in a withered state till the ripening of the seed; the pod inclosed in the calyx; and containing one or two, rarely three or four seeds. About 17 species belong to the flora of Britain. The most important of all to the American farmer is the COMMON RED C. (*T. pratense*), a native of America and of most parts of Europe, growing in meadows and pastures. It is a perennial, but is generally

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treated as if it were a biennial. Its heads of flowers are oval or nearly globular, very compact, about an inch in diameter, purple, more rarely flesh-colored or white; the tube of the calyx is downy; the stipules run suddenly into a bristly point. The leaflets have very often a whitish horseshoe mark in the center. This plant was formerly reputed very noisome to witches; knights and peasants wore the leaf as a potent charm against their arts. It is supposed that C. found its way into England from the Netherlands about the time of queen Elizabeth; but it was not until the close of the last century that it was introduced into Scotland, where it is now universally prevalent. The ZIGZAG C. (*T. medium*), also called MEADOW C., MARL-GRASS, and COW-GRASS, much resembles the common red C., but is easily distinguished by the smooth tube of the calyx, and by the broader, less membranaceous, and gradually acuminated stipules. The stems are also remarkably zigzag, and more rigid than in *T. pratense;* the heads of flowers are larger, more lax, more nearly globose, and of a deeper purple color; and the leaflets have no white spot. It is a common plant in Britain and most parts of Europe.—WHITE or DUTCH C. (*T. repens*) is also a common native of Britain and of most parts of Europe. When a barren heath is turned up with the spade or plow, white C. almost always appears. It is said to be a native also of North America, where, however, it is perhaps only naturalized. The flowers of all kinds of C. are the delight of bees, but those of this species perhaps particularly so.—ALSIKE C. (*T. hybridum*), a perennial, regarded as intermediate in appearance between the common red C. and the white C., has of late attained a very high reputation. It was introduced into Britain from the s. of Sweden rather more than twenty years ago.—CRIMSON C., or ITALIAN C. (*T. incarnatum*), an annual, native of the s. of Europe, with oblong or cylindrical spikes of rich crimson flowers, is much cultivated in France and Italy, and has of late been pretty extensively grown in some parts of England, producing a heavy crop.—MOLINER'S C. (*T. Molineri*) very much resembles crimson C., but is biennial, and has pale flowers. It is cultivated in France and Switzerland.—ALEXANDRIAN C., or EGYPTIAN C. (*T. Alexandrinum*), an annual species, a native of Egypt, universally cultivated in its native country, where it is the principal fodder for cattle, has been tried in Britain, but the colder climate has been found to render it less luxuriant and productive. It is supposed to be one of the best kinds of C. for many of the British colonies. It has oval heads of pale-yellow or whitish flowers.—YELLOW C., or HOP TREFOIL (*T. procumbens*), is very common in dry gravelly soils in Britain, but not much esteemed. It has smaller leaves and heads of flowers than any of the cultivated species. The flowers are yellow.

It is little more than a century since clovers were introduced into field-culture in Britain. They are now universally cultivated on large farms in alternation with grain crops. The kinds most generally sown are the *common red, cow-grass, Dutch white, yellow,* and *alsike.* The *common red* is the finest and most valuable, but it is difficult to grow unless on naturally rich soils. In America it grows well on sandy loams, though sown every alternate year on the same land. But in Britain the land is thought to become "clover-sick" when sown too frequently with this crop. An interval of not less than eight years is thought advisable. From 6 to 20 lbs. of seed per acre is the quantity sown. Red C. is most esteemed for being mixed with rye-grass for the making of hay. When it grows well, it bears to be cut more than once a year. *Cow-grass* much resembles the common red C. It is coarser but hardier, and better suited for pasture, as it bears more herbage, and comes better up after being eaten close down by stock. *Dutch white C.* is only esteemed for pasture; it grows short and thick on the ground, but throws out fresh stems and flowers during the most of the growing season. In the s. of England, it is sometimes sown with but little rye-grass seed along with it; in Scotland, as much as a bushel or a bushel and a half of rye-grass is mixed with it for pasture. *Yellow C.* is chiefly sown on ground where neither the white nor red grows freely. It is not sown so frequently as it probably ought to be, for it rises early in spring, and a mixture of it with other clovers forms good pasture on all grounds. *Alsike C.* has been recently introduced; it rises much higher than white C., and offers to be a useful addition to our pasture-plants. Land must be thoroughly cleaned of perennial weeds before it is sown with C., as the land cannot be subjected to cultivation while it is under this plant; C., therefore, is always sown in the end of the rotation, or as near the fallow or turnip crop as possible. It is sown early in spring among the winter-wheat, or with the barley crop, and slightly harrowed in; for the seeds being small are not difficult to bury. Farm-yard manure is as good as any for clovers. A well-manured soil greatly assists in keeping the plants from dying out in spring. Clovers, like grasses, play a most important part in restoring fertility to land which has been exhausted by grain-crops. Their leaves gather food—carbonic acid and ammonia—from the atmosphere, which they store up in their roots and stems; and these, on decomposing, afford food for cereals or other crops.

The caterpillars of a number of species of moth feed on the leaves of different kinds of C.; but the insects most injurious to the C. crops are weevils of the genera *apion* and *sitona*. See CLOVER-WEEVIL and PEA-WEEVIL.

CLOVER HILL, a magisterial dist. of Appomattox co., Va., near Appomattox Court-House. Pop. '90, 3860.

CLO'VER-WEE'VIL, *Apion,* a genus of small pear-shaped weevils (coleopterous insects, section *tetramera*, family *rhynchophora*), different species of which feed on the leaves, and their larvæ on the seeds of clover, some also on those of tares and other leguminous plants. Like the other weevils, the perfect insect has the head very much

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elongated into a sort of muzzle. *A. apricans* often does much injury to fields of common red clover, particularly interfering with the production of seed. It lays its eggs among the flowers, and the little grubs eat their way through the calyx into the pod. It is of a bluish-black color, little more than a line long. *A. flavipes* is attached in like manner to white clover, and other species of clover have their particular weevils.

CLOVES (Fr. *clou*, a nail) are the flower-buds of the clove-tree (*caryophyllus aromaticus*). The genus to which this tree belongs is of the natural order *myrtaceæ;* the calyx has a cylindrical tube and 4-cleft border; the corolla consists of four petals united by their tips; the stamens are in four clusters; and the fruit is an oblong dry berry with one or two cells and as many seeds. The clove-tree is from 15 to 40 ft. high, with a beautiful pyramidal head. The leaves are large, ovate-oblong, acuminated at each end, ever green: the flowers are small, but produced in great profusion in cymes. Leaves, flowers, and bark have an aromatic odor. The ripe fruit in shape resembles an olive, but is not quite so large; it is of a dark-red color; it sometimes appears in commerce in a dried state, under the curious name of *mother cloves;* it has an odor and flavor similar to C., but much weaker: the broken fruit-stalks are sometimes also used for the same purposes as C.; but the flower-buds themselves are the principal product of the tree. They are gathered, and are dried by exposure to the smoke of wood fires, and afterwards to the rays of the sun, or by the latter alone. When first gathered, they are reddish, but become of a deep-brown color. The unexpanded corolla forms a little round head at the end of the calyx tube, which is about half an inch long, and thus the appearance is not unlike that of a little nail, whence the name. The clove-tree is a native of the Moluccas, and the Amboyna C. are still esteemed the best; but the tree is now cultivated in Sumatra, Bourbon, Mauritius, and some parts of the West Indies, and will probably soon be common in many other tropical countries. The Dutch, in order to secure to their own colonists a monopoly of the trade in this spice, destroyed the trees in the other Molucca islands, and confined the cultivation of them to the isle of Ternate. It is not deemed quite certain that C. are the *karyophyllon* of the ancient Greeks; but before the discovery of the Spice islands, eastern merchants brought them from Arabia, Persia, and Egypt, to the harbors of the Mediterranean, from which the Venetians and Genoese diffused them over Europe.

The wild clove-tree of the West Indies is *myrcia acris*. See MYRCIA.

The properties of C. depend chiefly on an essential oil, *oil of C.*, which forms one fifth or one sixth of the whole weight. They are used for flavoring dessert dishes and articles of confectionery. They have a hot taste and a characteristic odor. The oil of C. is obtained by repeatedly distilling C. with water, when two oils pass over, one of which is lighter and the other is heavier than water. The oil has a hot acrid taste, is of a light yellow when pure, and brown red when not so carefully prepared. It has a well-known odor, and is soluble in ether, alcohol, and the fixed oils. It is useful in medicine to check nausea and griping, caused by the administration of purgatives. It is also employed in the scenting of soap, and by the distiller. *Tincture of C.* is obtained by treating C. with alcohol for several days, and then straining, or by a solution of the oil of C. in spirits of wine. It is added, in medicine, to stomachic, tonic and purgative mixtures.

CLOVIS (old Ger. *Chlodwig*, i.e., "famous warrior;" modern Ger. *Ludwig*, Fr. *Louis*), king of the Franks, was b. 465 A.D., and by the death of his father, Childeric, became king of the Salian Franks, whose capital was Tournay. His first achievement was the overthrow of the Gallo-Romans under Syagrius, near Soissons. He then took possession of the whole country between the Somme and the Loire, and established himself in Soissons. In 493, he married Clotilda, daughter of a Burgundian prince. His wife was a Christian, and earnestly desired the conversion of her husband, who, like most of the Franks, was still a heathen. In a great battle with the Alemanni, at Tolbiac, near Cologne, C. was hard pressed, and as a last resource, invoked the god of Clotilda, offering to become a Christian, on condition of obtaining a victory. The Alemanni were routed, and on Christmas day of the same year, C. and several thousands of his army were christened by Remigius, bishop of Rheims. Most of the western Christian princes were Arians, but C. was strictly orthodox, and, in consequence, was saluted by Pope Anastasius as the "Most Christian King." In 507, love of conquest concurring with zeal for the orthodox faith, C. marched to the s.w. of Gaul against the heretic Visigoth, Alaric II., whom he defeated and slew at Vouglé, near Poitiers, taking possession of the whole country as far as Bordeaux and Toulouse; but was checked at Arles, in 507, by Theodoric, king of the Ostrogoths. C. now took up his residence in Paris, where he died in 511. His great aim was the subjugation of all the Frankish princes, and the union of the whole Frankish people into a single powerful kingdom. The means he employed to secure this end were cruel and unscrupulous, but the end itself would have been very beneficial, if he had not frustrated it at his death by redividing the newly organized realm among his four sons, and exposing it to the very perils from which he himself had rescued it.

CLOWES, WILLIAM, 1779–1847: the first English printer to use steam presses (in 1823). He was the printer and publisher of the *Penny Magazine* and the *Penny Cyclopædia*. The establishment founded by him in London became one of the largest in England.

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CLOYNE, an ancient episcopal t. in the s.e. of Cork co., 15 m. e. by s. of Cork. The see was founded in the 6th c. by St. Colman, the abbey in 707, and the cathedral in the 13th century. Near the cathedral is a round tower, 92 ft. high. About 1430, the see was united to that of Cork, separated in 1678, and reunited in 1835. There are valuable marble quarries near. Berkeley was b. here, and was bishop of C. in 1678. Brinkley, the astronomer, was also bishop of Cloyne. Pop. in 1861 was 1713, but in 1891 had fallen below 1000.

CLUB. The word *club* is probably allied to *cleave* (German, *kleben*, "to adhere") with the notion of union, association, companionship.

Clubs may be roughly divided into four great classes, namely, *religious*, *commercial*, *political*, or merely *social* clubs. It is hard with any accuracy to assign these to different periods of national development. Thus, it would seem at first sight that the corporations (*collegia*) of Rome, whose founder we find to be Numa, were merely for convenience of trade. But we are also told that they had a political purpose as well as a social one, namely, to break down the barriers which separated Romans from Sabines in the infant state. Moreover, Plutarch mentions a religious element in them also, saying that Numa fixed certain times of meeting for these companies, and declared that certain honors should be offered to the gods, assigning to each what was suitable. Again, in Greece we have the testimony of Aristotle, that men of the same tribe or borough used to club together, some for social pleasure, and some to pay certain honors to the gods. It is quite clear, then, that whatever may have been the precise object of clubs or associations originally formed in ancient times, these distinctive marks were soon blotted out, and finally were altogether obliterated. With a certain degree of correctness we can assign the origin of the first political clubs to England, and next to France, whence afterwards they spread to the other countries of Europe. They were prohibited by a law of the German Empire, promulgated in 1793. The French clubs, during the revolution, must be considered as its focus. An accurate acquaintance with their history is, in fact, indispensable for the understanding of a great part of the revolution itself. They were connected and regularly organized, and their resolutions were published. In the minuteness of their ramifications throughout the country, they resembled the corresponding committees in the American colonies before and during the American revolution. These French clubs destroyed the Constitution of 1795, and were afterwards prohibited.

What is known as club-life had its origin in London in the days of Elizabeth, when the Mermaid Tavern, in Fleet Street, enlivened by the wit and wisdom of Ben Jonson, Raleigh, Shakespeare, Selden, Donne, Beaumont, and Fletcher, became the home of a sort of club. Ben Jonson afterwards founded a second club at the Devil Tavern, in the same street. Such clubs were meeting-places for social recreation, to which all were welcome who could bring wit and humor with them. Later on (in 1764), we find the literary club established and founded by Sir Joshua Reynolds.

The modern clubs of London, in which the restaurant or dining-room is an important feature, arose after the termination of the great war in 1815. Many naval and military officers, being no longer needed in the service, were placed upon half pay, which was often insufficient to supply their wants without the strictest economy. If they could dine together at some club, all sharing in the expense, it would be cheaper than if each maintained a separate establishment. Hence originated the United Service Club; and the immediate success of this at once led to the founding of others for different classes of society.

The number of regularly established clubs in London is more than 100, divided into literary, university, naval, and military, political, and purely social clubs. In many respects, English differ considerably from American clubs. To the American accustomed to the cheery *bonhomie* and warm, sympathetic atmosphere of his own club, the English club will seem chilly and depressing. As a rule, London clubs do not allow honorary memberships. Foreigners temporarily in England are usually excluded, so that Englishmen cannot, as a general thing, reciprocate to American visitors the favors extended to them at American clubs. The St. James, the Albany, the Army and Navy, Brooks's, Boodle's, the Oxford and Cambridge, the Reform and White's, are among the leading London clubs. The United Service, the Junior United Service, Naval and Military, the Army and Navy, and the Junior Army and Navy, are known as the "service clubs." The Army and Navy is familiarly called the "Rag." The Athenæum is, *par excellence*, the "bishops'" club. The Marlborough is the Prince of Wales's favorite club, having been founded by himself, and there he is surrounded by the members of his own "set." He belongs, however, to several other clubs, namely, the Guards', White's, the Turf, the Yorkshire, the Army and Navy, and the United University. The Guards' is exclusively for officers of the three regiments of Household troops. The Carlton, the Junior Carlton, the Conservative, and the Primrose, are the chief Tory clubs; the Reform, Brooks's, the City Liberal, and the National Liberal, the chief Liberal clubs. A name put up for membership at any of the great clubs has often to remain on the books for years before it can be voted upon, owing to the limitation of the membership. White's is the oldest London club, being established in 1730; after it comes Boodle's, 1762; Brooks's, 1764, and Arthur's, 1765. These clubs were originally coffee-houses.

The architectural magnificence of some of the London club-houses has lent dignity and character to the parts of London in which they are situated. The Athenæum has

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probably the choicest library of its kind, consisting of 50,000 volumes, mainly for reference. The Garrick has an exceedingly valuable collection of oil and water-color paintings, chiefly consisting of dramatic episodes. Although there are many good clubs in the "city" and to the eastward of Trafalgar Square, those known as the "West-End" clubs are, socially, of the highest repute.

The general business affairs of most London clubs are managed by committees made up of the trustees, who are usually permanent members, and ordinarily of twenty-four other members, chosen by the club at large, one-third of whom go out of office annually. The entrance fee ("subscription") for the various clubs ranges from £42 at the United University, to £4 at the Junior Athenæum.

The number of members in a London club varies from 6550 in the National Liberal to 280 in the Arundel.

Pall Mall, St. James Street, and Piccadilly, are the principal "club" streets of the West End. "Dues" are always called "subscriptions," and are divided into *entrance* and *annual*. Such clubs as the Abbotsford, the Bannatyne, the Roxburgh, and others of a like character, patronize and encourage the printing of unpublished MSS., or the reprinting of rare and valuable works. All the best clubs occupy entire buildings of their own, from the ground floor to the roof.

The celebrated club in Paris is the Jockey Club, which is the great social club, and not, as the name would imply, a racing club, like the Cercle de L'Ameneration des Cheveaux. Among the governors and committees of both these clubs one finds many of the noted and historic names of France. The Cercle de la Rue Royale, at the corner of the Rue Royale and the Place de la Concorde, is a club in many respects like the Knickerbocker Club of New York. It is extremely difficult to become a member, owing to the limited number, and is well known as the "smartest" club in Paris. Next door to it is the Cercle Impériale, frequented by Bonapartists. All French clubs are really modern affairs; and from time immemorial, and even to-day, the French cafés are used about as much for social meetings, etc., as the clubs proper.

Our club-houses in the United States resemble very much in appearance those in London. The oldest and most representative club in the United States is probably the Union, of New York city, which is situated on the corner of Twenty-first street and Fifth avenue. The Knickerbocker follows closely after the Union, and is undoubtedly the most exclusive club in New York. Its initiation fee is $300, and its annual dues are $200. As in London, it requires a long time after one's name is proposed to be elected to any of the principal New York clubs. The most famous political (Republican) club of New York is the Union League. The Calumet and the University, which only admit those graduated from a college, are two well-known social clubs of New York. The old Stewart mansion, at the corner of Thirty-fourth street and Fifth avenue, is now the home of the Manhattan Club, a famous Democratic body. In Brooklyn the most prominent political clubs are the Brooklyn Republican League, the Brooklyn Young Republican Club, the Kings County Democratic Club, the Thomas Jefferson Association, and the Union League Club.

The social clubs of Brooklyn are the Oxford, the Hamilton, the Lincoln, the Excelsior, and the Brooklyn.

In Boston the Somerset Club and the Algonquin are the best known. The Metropolitan and the Cosmos are the principal clubs of Washington. The Country Club, in the suburbs of Washington, is the finest of its kind in the United States. In Philadelphia the Philadelphia Club is a great social club, as are the Union League, a Republican club, and the Rittenhouse Club. The outside clubs near Philadelphia should not be omitted, namely, the Rabbit Club and the Fish-house Club. The principal club in St. Louis is the St. Louis Club, which is modeled after the Union League of New York. In Chicago there are many clubs, the most prominent ones being the Chicago, the Union, the University, and the Iroquois, the last being a great Democratic club. San Francisco is crowded with small clubs of all sizes, most of them being of a sporting character. The principal social club of that city is the Union. In New Orleans the Pickwick, the Boston, and the Pelican are the most important, the last-named being one of the greatest sporting clubs in this country.

The athletic clubs of the United States are unsurpassed, and the club houses of the New York Athletic and the Manhattan Athletic clubs are probably the finest in the world. The last-named was opened in January, 1891.

CLUB-FOOT (Lat. *talipes*) is a distortion or twisting of the foot by one or more of its muscles being permanently shortened. It may exist from birth, or occur in early childhood after convulsive fits. Surgeons recognize four varieties of C.: turning inwards (*varus*), outwards (*valgus*), downwards with elevation of the heel (*equinus*), or upwards with depression of the heel (*calcaneus*).

As age advances, the bones alter in form from the pressure exerted upon them, the ligaments shorten, and the foot becomes rigidly molded in its unnatural position. It cripples the person's movements, and in many instances has proved a great affliction. Lord Byron's whole life seems to have been embittered by one of his feet being inverted.

Although Lorenz, in 1784, cut the tendo Achillis to lower the heel in talipes equinus, yet, owing chiefly to the dangers of cutting across tendons, club-foot was practically

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incurable till 1731, when Dr. Little, of London, having himself a club-foot, after seeking relief from many surgeons at home and abroad, found his way to Dr. Stromeyer, at Erlangen. This ingenious surgeon introduced a narrow-bladed knife, and divided the tendons of the contracted muscles with such a small external wound that scarcely any inflammation resulted. Dr. Little being cured, published a treatise on the subject, and at the present day no deformity of the foot is considered irremediable.

CLUB-MOSS. See LYCOPODIACEÆ.

CLUB-RUSH. See SCIRPUS.

CLUNIACS, or CONGREGATION OF CLUNY, an order founded at Cluny, in France, in 909, by the Benedictines. It spread rapidly, and at one time had more than 2000 convents. It was suppressed in 1790 by the constituent assembly. Among its great men were Gregory VII., Urban II., and Pascal II.

CLUNY, or CLUGNY, a t. in France, in the department of Saône-et-Loire, 12 m. n.w. of Mâcon; pop. '91, 4073. There is considerable agricultural trade, and manufactures of pottery, paper, etc. Its importance lies chiefly in its ancient architecture, including, besides the celebrated abbey, the church of Notre Dame, dating from the 13th c., the church of St. Marcel, with a beautiful spire; the ruins of St. Mayeul; portions of the ancient fortifications; and picturesque houses dating from the 12th c. and onward, all classed among the historical monuments of France. Before the erection of St. Peter's at Rome, the abbey church at Cluny was the largest building of its kind in Europe, being 650 ft. long by 130 wide.

CLUPESO'CIDÆ, a family of malacopterous fishes, so named from being regarded as exhibiting characters intermediate between those of the *clupeidæ* (herring, etc.) and of the *esocidæ* (pike, etc.). Some of them are marine, and some are fresh-water fishes. They are mostly tropical; none are British. To this family belongs the interesting genus *arapima* (q. v.), and the genera *heterotis* and *butirinus*, containing fishes of very curious structure and appearance, highly prized for the table. See HERRING, SARDINE, SPRAT.

CLUSERET, GUSTAVE PAUL, b. Paris, 1823; educated in the military school of St. Cyr; in 1848, made a maj. of the *garde mobile*, participating in the suppression of the insurrection in June of that year. He served in the Crimea, where he was wounded; and against the Kabyles in 1856; resigning his commission in 1858. In 1860, he joined Garibaldi's staff, and commanded the French legion. In 1862, he came to the United States, took service on gen. McClellan's staff, and afterwards served with Fremont. He became brig.gen. of volunteers in 1862, and two years afterwards resigned and became editor of a weekly paper in New York, advocating Fremont, and opposing Lincoln for a second term. He returned to France in 1867, but was expelled for certain publications concerning a great railway project in the United States in which some officers of the French government were interested. In the war with Germany, he opposed Louis Napoleon's government, and engaged in some unimportant insurrectionary attempts in Lyons and Marseilles. Under the commune he was made minister of war, but was suspected of treachery, and for a time imprisoned. He escaped to Switzerland on the downfall of the commune; in 1872 was formally sentenced to death in his absence; and in 1880 returned to Paris under the amnesty.

CLU'SIA (named in honor of the great botanist L'Ecluse or Clusius), a genus of tropical trees and shrubs of the natural order *guttiferæ* (q.v.) or *clusiaceæ*, some of which are commonly called balsam trees, from their resinous or balsamic products. They are very often *epiphytes*, growing on larger trees, over the bark of which their roots spread in search of chinks or decayed parts where they may obtain nourishment; and if it cannot be obtained in sufficient quantity, a root is sometimes sent straight down to the ground, and in due time becomes a kind of stem. The fruit is very curious, a sub-globular capsule, with a number of cells, opening as by meridian lines from top to base. *C. rosea*, a native of the West Indies and tropical parts of America, yields an abundant resin, which is used as an external application in veterinary medicine, and for covering boats instead of pitch. A great quantity of resin exudes from the disk of the flowers of *C. insignis*, the WAX-FLOWER of Demerara, which is used to make a gently stimulating and soothing plaster. This is one of the productions of Demerara, to which the colonists, in preparation for the "Great Exhibition" (of 1862), sought to draw general attention.

CLUSIUM. See CHIUSI.

CLUSO'NÉ, a t. of Lombardy, northern Italy, situated near the left bank of the Seiro, 17 m. n.e. of Bergamo. It has manufactures of linen, a trade in corn and iron, and in the neighborhood are vitriol works and copper foundries. Pop. 4,000.

CLUSTERED COLUMNS, or, as they are sometimes called, compound piers, form one of the richest features in Gothic ecclesiastical architecture. The columns or shafts are sometimes attached to each other throughout their whole length, sometimes only at the base and capital. When surrounded by floriated fillets, they have been very aptly compared by sir Walter Scott to "bundles of lances that garlands have bound."

CLUVER, PHILIP, 1580–1623; a German, who traveled in Poland and other countries; first studied law, but forsook it for geography with Joseph Scaliger at Leyden for his teacher. He served two years in the army, visited England, where he married:

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passed some time in Scotland and France, and returned to Holland, where he published a number of works on geography, all relating to antiquity, except *Introductio in Universam Geographiam.*

CLWYD, a river of North Wales, rises in the Bronbanog hills, in the s.w. of Denbigh shire, and runs 30 m., first s., then e.n.e., and lastly n., through Denbigh and Flint shires, past Ruthin, St. Asaph, and Rhuddlan, into the Irish sea. Below Ruthin, and between barren hills, lies the fertile, populous, and level vale of the C., 15 by 5 to 7 miles. At St. Asaph, the C. receives the Elwy, 20 m. long, from the west, and increases much in size. It then enters the fertile and extensive marsh of Rhuddlan, and falls into the sea by a small estuary. It is navigable for vessels of 70 tons up to Rhuddlan, a distance of 3 m. from its mouth.

CLYDE, a river in the s. of Scotland, the only great British river, besides the Severn, flowing west. Commercially it is the most important river in Scotland, and the romantic beauty of its scenery is widely celebrated. It rises by several large streams in the semicircular range of the Lead, Lowther, and Moffat hills and drains the shires of Lanark, Renfrew, and Dumbarton. The main and southmost source, the Daer, runs n., and receives the Powtrail, the Clyde (a smaller stream, after junction with which, the main stream is called the C.), and other streams, preserving its mountain character to Roberton, upwards of 20 m. below the source of the Daer. The C. then bends round Tinto hill towards Biggar, from whence it flows n.w., w., and s.w., to about 4 m. above Lanark, thence pursuing a n.w. course through Lanarkshire, and between Dumbarton and Renfrew shires, past Lanark, Hamilton, Glasgow, Renfrew, and Dumbarton, near which town it opens into the firth of Clyde. In this course it receives a number of streams, and flows through a rich, fertile, wooded valley, often extending into level plains, and often with bold wooded banks. From 2 m. above to 4 m. below Lanark occur the celebrated falls of the C., a series of cascades and rapids, the largest in Scotland for quantity of water—the total descent, in the course of 6 m., being 230 ft., over old red sandstone rocks, amid very picturesque scenery. Two of the falls are above, and two below Lanark. Bonniton linn, 2 m. above Lanark, is a cascade of 30 ft., with some parts only 4 ft. broad. Corra linn, half a mile below the last, is the grandest fall, forming three distinct leaps—in all, 84 ft. high. Dundaf fall is ten ft. high. Stonebyres linn, 2 m. below Corra linn, forms three distinct falls—in all 70 feet. Below Glasgow, the C. expands into an estuary, navigable by the largest vessels, and at Greenock it attains a breadth of about 4 miles. Opposite this point it communicates with the Gareloch, and a little below, with Loch Long on the north. Its course, which from Glasgow has been w.n.w., now turns suddenly s., in which direction, inclining a little to the w., it continues to flow between Argyle and Bute, and Cantire on the w., and Renfrew and Ayr shires on the e., until it becomes identified with the North channel at Ailsa Craig, where its breadth is about 30 miles. The C. from its source to Glasgow is, by its windings, 75 m. long, and from Glasgow to the south end of Cantire, 48 miles. Its basin occupies 1500 sq. m., and consists of carboniferous strata and trap rocks, the latter chiefly forming the bordering mountains. Floods sometimes raise its waters 20 ft., and it has changed its course at Renfrew, which was once close to it. Clydesdale, or the valley of the C., is noted for its coal and iron mines, orchards, and horses. Bell, in 1812, launched on the C. the first boat in Europe successfully propelled by steam.

CLYDE, a village in Wayne co., N. Y., on Clyde river, the Erie canal, and the West Shore and the N. Y. Central and Hudson river railroads, 38 m. w. of Syracuse; pop. '90, 2638. It is a place of active trade, and has a considerable manufacturing industry.

CLYDE, Lord. See **Campbell, Sir Colin.**

CLYMER, George, 1739–1813; b. Philadelphia; one of the signers of the American declaration of independence. He was a member of the council of safety, and with four others was appointed to take the place of the Pennsylvania delegation in the continental congress which had refused to sign the declaration of independence. He filled various important positions, both military and civil, until the peace of 1783. Afterwards he was sent to the legislature, and in 1787, was a member of the convention that framed the U. S. constitution. He was also a member of the first federal congress, and held many honorable offices in Philadelphia.

CLYMER, Heister, 1827–84; b. Penn.; graduated at Princeton, 1847; was admitted to the bar, 1849; in state senate of Penn., 1860–66; was defeated as the democratic nominee for gov., 1866; elected as a democrat to the XLIIIrd and two succeeding congresses.

CLYSTER (Gr., from *klyzo,* I wash out), called also *enema,* a medicine administered in the liquid form by the rectum, or lower end of the intestine. It is used either for the purpose of procuring evacuation of the bowels, or of conveying stimulating or nourishing substances into the system. For the latter purpose, wine and beef-tea, or milk, in quantities of a few ounces at a time, are employed; for the former, simple warm or cold water in sufficiently large quantity to distend the bowels, and produce evacuation; or in special cases, various cathartics may be used in addition, such as colocynth, aloes, castor oil, or turpentine made into an emulsion with yelk of egg, and sometimes carminatives, to expel air. Narcotic clysters are also employed, but should only be used under medical superintendence. An injecting syringe, with a flexible tube, and a double-action valve, is usually employed for the administration of this remedy.

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CLYTEMNES'TRA, in Homeric legend, the daughter of king Tyndareus and of Leda, and the twin-sister of Helena, became the wife of Agamemnon, and bore him a son, Orestes, and two daughters, Iphigenia and Electra. During the absence of Agamemnon on his expedition to Troy, she formed a connection with Ægisthus, murdered her husband on his return, and reigned for seven years with Ægisthus, till she was murdered by her own son, Orestes.

CLYTIE, a water nymph in love with Apollo. Meeting with no return for her affection, she was changed to a sunflower. In that form she gazed upon Apollo (the sun), and hence the notion that this flower turns on its stalk as the sun moves along the sky, always presenting its full face to that luminary.

CNEPH, the name under which the Egyptians adore the creator of the world.

CNI'DUS, or GNIDOS, a city on the promontory of Triopion (now cape Krio), in Caria, in Asia Minor, a Lacedæmonian colony, and one of the six cities of the Doric league. C. (according to Strabo) had two ports, one of which could be closed. In front of what was the town, lies a lofty island, about 600 yards long, which was connected with the mainland by a causeway (now a sandy isthmus). The southern port was formed by two moles, carried into the sea to the depth of nearly 100 ft., one of which is nearly perfect at the present day. The city was famous for several temples of Venus, who was therefore sometimes called the Cnidian goddess. One of these temples contained the famous statue of the naked Venus by Praxiteles. It was of Parian marble, and so beautiful, that Nicomedes, king of Bithynia, offered, in return for this masterpiece of Grecian sculpture, to pay the entire debt of the city, which was very large. The Cnidians, in the excess of their devotion to art, refused. During the wars in ancient times, C. was often mercilessly plundered. The site of the city is "covered with ruins."

CNOSSUS, or GNOSSUS, a city of Crete on the n. side of the island, 8 m. from the coast, said to have been founded by Minos, a traditional king of the island. Tradition says that Jupiter was born, married, and buried near Cnossus; and it is also said to have been the site of the labyrinth in which the Minotaur was confined. This fable may have arisen from the many intricate caverns in the region. The inhabitants were Dorians, with Dorian manners, customs, and political institutions. With the other parts of the islands it finally became a Roman colony. Among its great men were Ænesidimus, the skeptic philosopher, and Chersiphron, the architect of the temple of Diana at Ephesus.

COACH is a general name for a vehicle drawn by horses, designed for the conveyance of passengers, as distinguished from a wagon or cart, for the conveyance of goods. Coaches or inclosed carriages, drawn on wheels, and intended for passengers, were inventions which have been claimed by Hungary, England, Italy, France, Spain, and Germany. The name is derived by Wedgwood from Fr. *coucher*, to lie, which becomes in Dutch *koetsen*, whence *koetse* or *koets-wagen*, a litter or carriage in which you may recline. The earliest record found by Beckmann relates to about the year 1280, when Charles of Anjou entered Naples, and his queen rode in a *caretta*—apparently a small but highly decorated car, from which the modern *charet* or *chariot* was derived, as well as other vehicles named *chares* and *charlettes*. It is believed that most of these vehicles had broad wheels, the only form suited for the wretched roads of those ages; and it is certain that all those of early date were open overhead. Many of the coaches used by the continental princes and nobles in the 16th c. were closed only to this extent—that they had canopies supported by ornamental pillars, and curtains of cloth, silk, or leather, which could be drawn easily aside. A *glass* C., or C. with glass windows, is specially mentioned as being used by a infanta of Spain in 1631. The traces of the coaches were at first made of rope; those only belonging to the highest personages were made of leather. It is believed to have been in the time of Louis XIV. that coaches were first suspended by leathern straps, in order to insure ease of motion.

The first C. ever seen in England is said to have been one made in 1555 by Walter Rippon for the earl of Rutland; and in 1564, the same builder made a showy vehicle for queen Elizabeth. Later in the reign, the royal carriages had sliding panels, so that the queen could show herself to her loving subjects whenever she desired. During the closing years of Elizabeth's reign, and early in the 17th c., the use of pleasure-carriages extended rapidly in England. The coaches had first to struggle against the opposition of the boatmen on the rivers, and then against that of the sedan owners and bearers; but they gradually came into very general use. The successive steps whereby the coaches of those days gave way to the elegant vehicles of the present, need not be traced in detail, even if there were the means to do so.

Among the best-known pleasure carriages are the following, the country of their origin being indicated in parenthesis: *barouche* or *calèche* (France), a four-wheeled carriage with a top or hood at the back, and seating four persons besides two on the driver's seat; *britzka* (Austria) a smaller and more elegant form of barouche; *brougham* (England), a small four-wheeled carriage, for two persons besides the driver; *buggy* (India), from the Hindu *bagghi* "vehicle," now chiefly American, a very light four-wheeled vehicle for two persons, with or without a top; *cabriolet* (France), a two-wheeled vehicle for one horse, and better known as a *cab*; *clarence* (England), a double brougham drawn by two horses; *char-à-banc* (France), a light open wagon with two long seats at the sides facing each other; *curricle* (Italy), a two-wheeled vehicle for two horses, seating two persons;

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dog-cart (England) a two or four-wheeled open vehicle for one horse; *drag* (England), a heavy coach with additional seats on the top; *gig* (England), a heavier form of buggy, with a top; *hansom* (England), a two-wheeled covered vehicle for one horse, and two occupants, opening in front and having the driver's seat at the back, in a sort of perch at the top; *landau* (Germany), an open four-wheeled carriage for four persons, with a hood at the back that may be lowered; *beach-wagon* (America), a light open wagon with several seats; *stanhope* (England), a lighter two-wheeled or four-wheeled carriage without a top, for two persons; *surrey* (England), a four-wheeled carriage for one or two horses, open at the side, and with a light top; *phaeton* (England), an open four-wheeled vehicle for either one or two horses, seating two persons; low and light, with the body often of basket-work, used by ladies; sometimes with a canopy supported on a rod at the back; *tilbury* (England), a two-wheeled vehicle for one horse, without cover, seating two persons; *victoria* (England), a four-wheeled carriage for two persons, with a driver's seat and a hood at the back, for four horses.

For many years the English coach and carriage builders were justly esteemed the most successful in the world, but of late they have been rivalled by some of the great American firms whose workmanship combines both strength and elegance to a remarkable degree. The light buggies and trotting-wagons made in this country are superior to any made abroad; and certain new forms of pleasure vehicles, such as the buck-board (q.v.), have been developed here.

Carriage-building in reality combines many trades in one, having to do as it does with so great a diversity of materials as iron, wood, steel, brass, cloth, leather, hair, ivory, and such additional processes as painting, joining, polishing, varnishing, etc. The best woods for carriage-building are ash (for the frame-work), elm and oak for the wheel, and American hickory for the shafts and poles, as well as for the wheel-spokes. The finest grades of carriages and wagons are now generally supplied with heavy soft rubber tires which make no noise upon the pavements and act as additional springs for the vehicle.

COACH-DOG, or DALMATIAN DOG. See CARRIAGE DOG.

COACHING. Driving parties on large drags, or coaches, drawn by four horses, have been popular among the English nobility for a long time. Amateur coaching began in this country in 1864, with August Belmont (although passenger coaches were in vogue from earlier times). Leonard Jerome was the first to drive an American-made coach. The New York coaching club was founded, 1875, by Leonard Jerome, James G. Bennett, Frederic Bronson, William Jay, Delancey Kane, Thomas Newbold, Wm. P. Douglas, S. Nicholson Kane, and A. Thorndike Rice. It has 35 coaches, and no one belongs to the club who does not own a drag, unless he be the son of a member who is part owner. The uniform consists of a dark green dress coat with black velvet collar, yellow striped waistcoat, and black trousers. There are two parades during the year, the first occurring in May, at New York, and the second in August, at Newport, and in summer, long and delightful drives are taken through the mountains. Carnegie's *An American Four-in-Hand in Great Britain* and Champlin's *Chronicles of the Coach*, give entertaining accounts of experiences in coaching. See TALLY-HO.

COACH-WHIP SNAKE, a serpent of the United States, having a long narrow head, small neck, long body, and a tail like the lash of a whip. It is sometimes more than two yards long. It is not venomous, but will defend itself with great courage by twining its long folds around an enemy. It lives on birds and small animals. Found only in the states of South Carolina, Georgia, and Florida.

COAGULATION, the amorphous (q.v.) solidification of a liquid, or part of a liquid, as when the caseine of milk is solidified by rennet in making cheese (q.v.), or the white of an egg by boiling. The process varies in various substances. Albumen, or the white of an egg, coagulates at a temperature of 160°. Milk is coagulated or curdled by the action of rennet or by acids. The fibrin in the blood, chyle, and lymph of animals is coagulated by the separation of these fluids from the living body. See BLOOD.

COAHO'MA, a co. in n.w. Mississippi, on the Mississippi river; 500 sq. m.; pop. '90, 8642, includ. colored. Co. seats, Friar's Point and Clarksdale.

COAHUI'LA, a state of the Mexican confederation, is separated from Texas, in the United States, by the Rio Bravo del Norte, in lat. 24° to 30° n., and long. 100° to 103° east. It contains 63,569 sq. m., and (1895) 235,638 inhabitants. The capital is Saltillo, with a pop. of over 22,000; there are besides the towns of Coahuila and Santa Rosa. It possesses some silver mines; but it is valuable chiefly for its pasturage.

COAT'TA. See ATELES.

COAL, in the sense of a piece of glowing fuel (and hence a piece of fuel, whether dead or alive), is a word common to all the languages of the Gothic stock (Icel. *kol*, Ger. *kohle*), and seems allied to the Lat. *caleo*, to be hot; as also to *glow*, and *kiln*. The different sorts of fuel are distinguished by prefixes, as *char*coal, *pit*-coal, *sea*-coal; but in England, owing to the absorbing importance of mineral or pit-coal, the word C. alone has come to be used in this special signification (Ger. *steinkohlen*, Fr. *charbon de terre*).

Coal is one of the most important of minerals; it consists chiefly of carbon, and is

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universally regarded as of vegetable origin. Its geological relations are noticed in the article CARBONIFEROUS SYSTEM. It generally occurs in strata or beds; it is always of a black or blackish-brown color; some of the varieties have a very considerable degree of vitreous or resinous lustre, and some are very destitute of lustre; some have a shell-like fracture, and some have a sort of slaty structure, and are readily broken into cubical or rhomboidal fragments. The precise characters of coal as a mineral species are not easily defined, and both in England and other countries important cases have occupied courts of law, in which this difficulty was strongly felt, as in the great Scottish lawsuit concerning the Torbanehill Mineral (q.v.). Coal, indeed, is rather a commercial than a scientific term, but in a general way we may define it as a fossil fuel of black color and stony consistency, which, when heated in close vessels, is converted into coke with the escape of volatile liquids and gases. The variety known as "blind coal" or anthracite no doubt gives off scarcely any volatile matter, but this is because it has undergone a natural distillation through metamorphism or other cause. We may therefore divide coal into two primary divisions, namely, (1) ANTHRACITE, which does not, and (2) BITUMINOUS COAL, which does flame when kindled. Anthracite (q.v.) sometimes contains as much as 94, and if we exclude the ash, 98 per cent of carbon, and as this element decreases in amount it graduates into a bituminous coal. The term anthracite is, however, still applied to some coals which do not contain more than 80 per cent of carbon. Various synonyms, such as stone coal, glance coal, culm, and Welsh coal, are also used to designate this substance, which is used for smelting purposes and for raising steam, and in base-burning stoves gives out a high heat in combustion. Bituminous coal includes an almost endless number of varieties, one of the best marked being CANNEL or PARROT COAL. Cannel coal is so called from burning with a bright flame like a candle, and the name parrot coal is given to it in Scotland from the crackling or chattering noise it makes when burned. That of different localities varies much in appearance, but it is most commonly dull and earthy, or with only a slight lustre; some examples are, however, bright and shining. In texture it is nearly always compact, and certain beds of it admit of being polished in slabs of considerable size, which approach black marble in appearance. Of this material vases, inkstands, boxes, etc., are made. Cannel coal, from the large percentage of ash which it contains, is not suitable for house fires, and is for the most part consumed in making gas, of which it yields from 8,000 to 15,000 cubic ft. per ton. When distilled at a low red-heat it yields paraffin oil. The other varieties of bituminous coal are so numerous that, as an admiralty report states, there are as many as 70 denominations of it imported into London alone. Still, among these there are three leading kinds—1. CAKING COAL, which cakes or fuses into one mass in the fire. It breaks into small uneven fragments, and is found largely at Newcastle and some other localities. 2. CHERRY or SOFT COAL, which breaks easily into small irregular cubes, has a beautiful shining lustre, is readily kindled, and gives out a cheerful flame and heat.

The use of coal does not seem to have been known to the ancients; nor is it well known at what time it began to be used for fuel. Some say that it was used by the ancient Britons; and at all events it was to some extent an article of household consumption during the Anglo-Saxon period as early as 852 A.D. There seems to be reason for thinking that England was the first European country in which coal was used to any considerable extent. About the end of the 13th c., it began to be employed in London, but at first only in the arts and manufactures; and the innovation was complained of as injurious to human health. In 1316, the parliament petitioned the king, Edward II., to prohibit the use of coal, and a proclamation was accordingly issued against it; but owing to the high price of wood, its use soon became general in London. It was for a long time known there as SEA COAL, because imported by sea.

Several theories as to the mode of the origin of coal have been put forth from time to time. The one now generally believed in is that the rank and luxuriant vegetation which prevailed during the carboniferous age grew and decayed upon land but slightly raised above the sea; that by slow subsidence this thick layer of vegetable matter sunk below the water, and became gradually covered with sand, mud, and other mineral sediment; that then, by some slight upheaval of the sea bottom or other process, a land surface was once more formed, and covered with a dense mass of plants, which in course of time decayed, sank, and became overlaid with silt and sand as before. At length, thick masses of stratified matter would accumulate, producing great pressure, and this, acting along with chemical changes, would gradually mineralize the vegetable layers into coal. Some experiments made by Dr. Lindley, many years ago, showed that of a large number of plants kept immersed in water for two years, the ferns, lycopodiums, and pines were those which had the greatest powers of resisting decay, and coal appears to be mainly composed of the substance of the ancient representatives of these three orders of plants. The interesting fact has also been lately proved by Huxley, Morris, Carruthers, and others, that in many instances the bituminous matter in coal is almost wholly formed of the spore cases and spores of plants allied to our club mosses and ferns.

As will be seen from the following table, wood, peat, lignite or brown coal, and true coal, indicate by their composition the changes which vegetable matter undergoes by decay and pressure.

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	Wood.	Peat.	Lignite.	Coal.
Carbon	50.0	60.0	65.7	82.6
Hydrogen	6.2	6.5	5.3	5.6
Oxygen	43.8	33.5	29.0	11.8
	100.0	100.0	100.0	100.0

In each of these bodies there is usually a small percentage of nitrogen, which in the above table has not been separated. In passing from wood or peat to C., the proportion of oxygen and hydrogen decreases, these substances being given off in the form of marsh-gas and carbonic acid in the process of decay.

Since the prosperity of the great national industries, as well as much of the domestic comfort, depends on the continuance of an abundant supply of cheap fuel, much anxiety has arisen in Great Britain of late years regarding the future supply and price of coal. Since the fall of 1872, a great rise has taken place in its price. This is partly owing to the unusually high rate of miners' wages which has prevailed, and partly to the fact that some of the richest and most easily worked English coal-seams are becoming exhausted. There is therefore some cause for apprehension, yet, as the following figures taken from the estimate in the report of the Royal Commission on Coal, dated 1871, will show that Great Britain has still vast supplies of fossil fuel.

Taking into account the coal which probably exists under the permian, new red sandstone, and other superincumbent strata in the United Kingdom, the C. commissioners increase their estimate of the quantity still available for use to 146,480 millions of tons. At the present rate of annual production—namely, 185,500,000 tons, this would last 1186 years. But, as may be supposed, the estimates which have been put forth regarding the probable duration of the coal-fields are very various, some authorities asserting that, owing to increase in population, and the increasing consumption of coal in manufactures, about 100 years will suffice to exhaust them. Between this and the other extreme of about 1000 years, formed on the assumption that hereafter the population of the country will but slightly increase, there are innumerable conjectures and estimates. (185,479,000 tons were raised in 1891, from British collieries).

AVAILABLE COAL IN THE CHIEF BRITISH COAL-FIELDS AT DEPTHS NOT EXCEEDING 4000 FEET, AND IN SEAMS NOT LESS THAN 1 FOOT THICK.

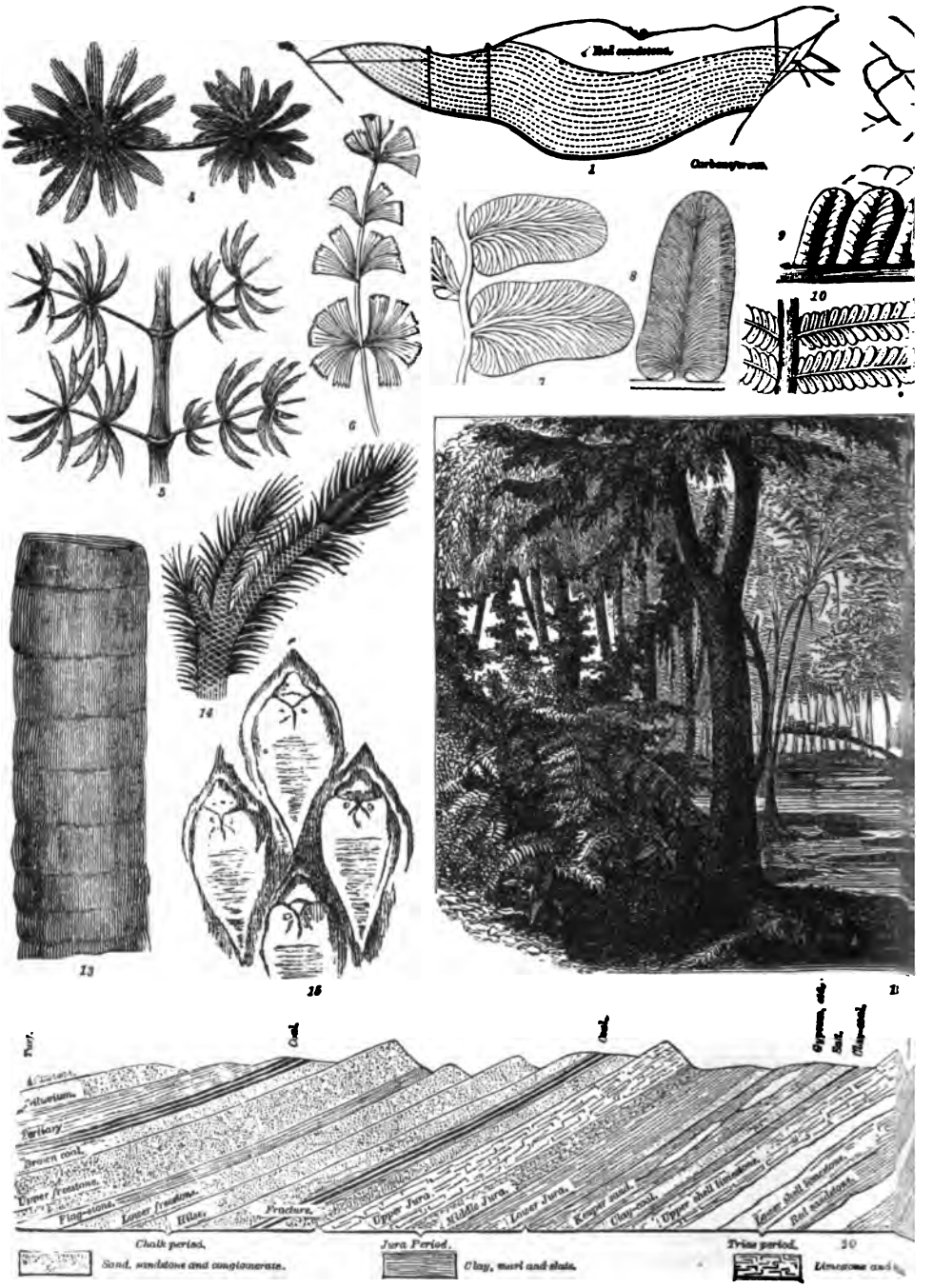
	Tons.
South Wales	32,456,208,918
Midland (Yorkshire, Derbyshire, and Nottinghamshire)	18,172,071,433
Northumberland and Durham	10,036,660,236
Lancashire and Cheshire	5,546,000,000
Bristol	4,218,970,762
North Staffordshire	3,825,488,105
Lesser English coal-fields	5,952,740,019
Total of Scottish coal-fields	9,843,465,930
Total of Irish coal-fields	155,680,000
Grand total	90,207,285,398

On the continent of Europe, productive coal-fields occur in Belgium, France, various parts of northern Germany, Spain, and Russia. By far the largest in area are those of Russia, and they are known to contain many valuable beds of C., although, as yet, comparatively little has been worked. C. is also found in India, China (where the coal-fields are estimated to cover 400,000 sq.m.), Japan, and the Malayan archipelago, in Australia and New Zealand, and in Africa. Turning to the new world, there is evidence of promising coal-deposits in several South American countries, but, owing to the great supply of wood in their forests, there is little temptation to work them. In Canada, Nova Scotia, New Brunswick, and Newfoundland, there are small though valuable coal-fields; but, in the United States, enormous fields of fossil fuel are found. The entire area of these is about 300,000 sq.m., being 40 times greater than the area of the coal-fields of Great Britain. But although the coal-measures of the states are of vast extent, and contain many valuable coal-seams—a few of them 40 and even 50 ft. thick at certain places—it has been doubted whether the amount of workable C. in them is not possibly been somewhat overestimated. In proportion to the extent of the seams, the quantity of coal annually raised in the states is small, being about 130,000,000 tons.

COAL-TRADE.—The production and sale of coal, like every other important branch of industry, was long fettered with legislative regulations. At a very early period, the corporation of the city of London undertook the duty of either weighing or measuring the C. brought into the port, and by a series of statutes, commencing with 7 Ed. VI. c. 7, the mayor and aldermen of London, and the justices of the counties, were empowered to fix the price of C. to be sold by retail; and in case of refusal by the parties to sell at the prices fixed, to enter their wharves, or other places of deposit, and to cause it to be sold at the prices which they had set. In addition to the general supervision which they thus possessed, and the sums which they were empowered to exact for their

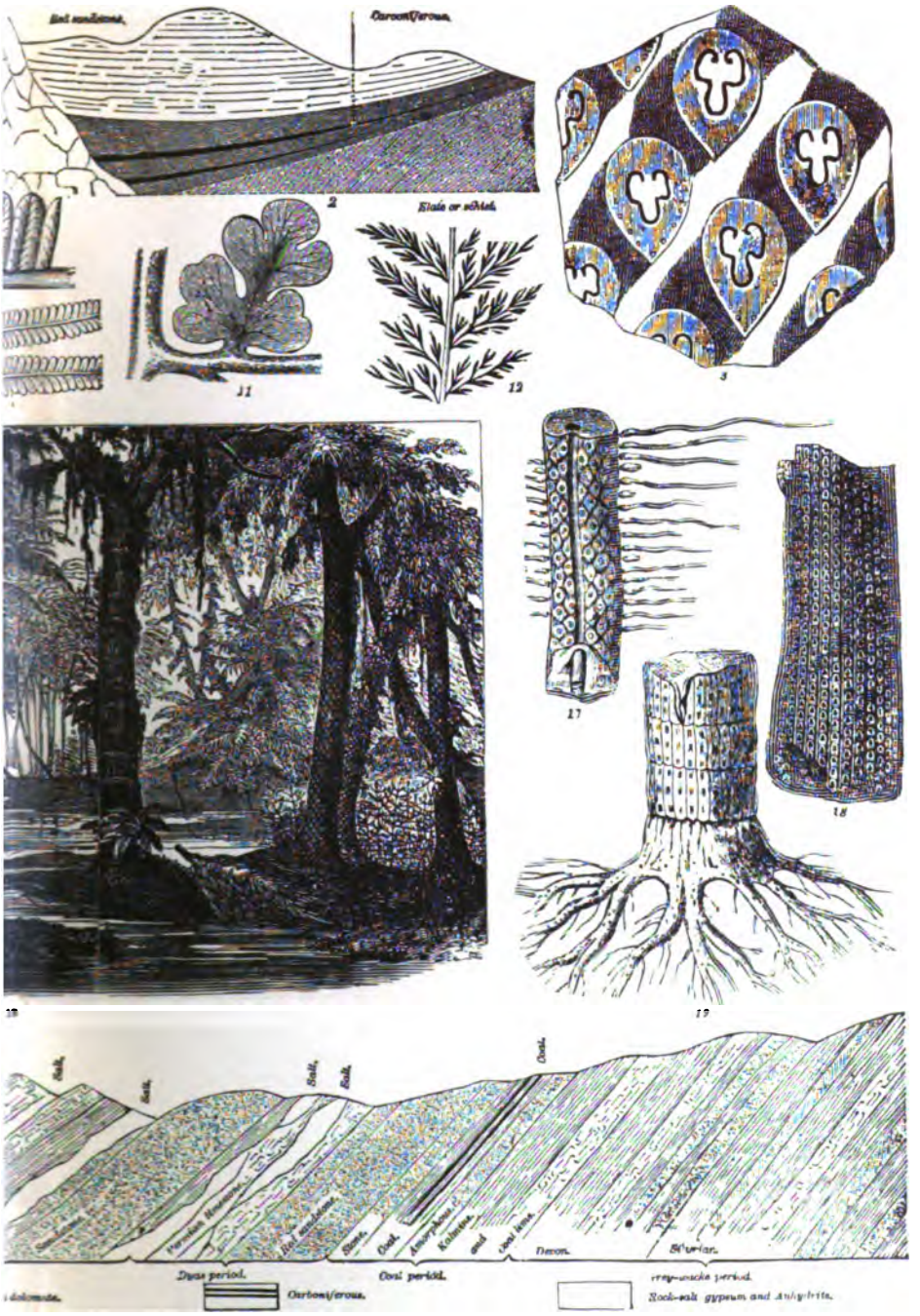
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COAL AND ROCK SALT.—1. Diagonal section of a coal-bed. 2. Ideal representation of a pa... protopteris. 4. Branch and leaf-types of annularia. 5. Branch and leaf of asterophyl... 13. Fragment of a calamite trunk. 14. Branches and fruit of a lepidodendron. 15. Ba... 17, 18. Trunk and root of a sigillaria. 19. Trunk and root of sigillaria, joined. 20. C...

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ırtial or incompletely carbonified region (future coal-bed). 3. External impression of a llum. 6. Sphenofilli. 7, 8. Neuropterides. 9, 10. Pecopterides. 11, 12. Spehopterides. ark of lepidodendron. 16. Ideal landscape of forest and swamp in the carboniferous period. arboniferous and salt deposits in Germany.

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trouble, the corporations of London and other towns have exacted, and still continue to exact, dues on C. for local purposes. These were first imposed in London, in 1667, after the great fire, in order to enable the corporation to repair the ravages which it had committed; and they have been since continued as a fund for civic improvements, though, as Mr. M'Culloch has remarked, no improvement could be equal to a reduction in the price of coal. In the reign of William III., a general tax, payable to government, was laid on all sea-borne coal—a tax which was in the highest degree unjust to places which were dependent for their supply on the coasting-trade, and oppressive to the whole country, inasmuch as it amounted to more than 50 per cent on the price paid to the owner at the pit's mouth. The tax varied in amount, not only at different periods, reaching its highest point of 9*s.* 4*d.* per chaldron during the great war, but also in different parts of the country, being higher in London and the s. of England, and lower in Ireland and Wales, whilst Scotland for a considerable period was altogether exempt. The tax itself, with all its inequalities, was abolished in 1830, and there is now no tax on C. except that collected for local purposes in London, and a few other towns. The repeal, in 1845, of the duty on C. exported to foreign countries, was a measure of much more doubtful policy. The average annual quantity of C. exported from Great Britain during the three years ending 1888, was above 25,000,000 tons.—For the provisions of the recent statutes for the regulation and inspection of mines (23 and 24 Vict. c. 151, and 35 and 36 Vict. c. 76), see MINES. The circumstances in which coal-mines are regarded as a pertinent of land, and those in which they form a separate estate, are stated under MINES.

In the countries of North America the carboniferous strata are divided by geologists into two principal groups: the lower or sub-carboniferous, which corresponds to the carboniferous limestone of Europe; and the carboniferous, which includes the millstone grit and the coal-measures. The first of these is about 5,000 ft. thick in Pennsylvania, consisting mainly of shales and sandstones; but in the Mississippi valley, in Illinois, Iowa, and Missouri, a considerable thickness of limestone is developed in this part of the series. In the former region some thin coal-seams are found, the relation between the two areas being in this respect similar to that of the carboniferous limestone in England to the coal-bearing formations of similar age in Scotland. The millstone grit forms a mass of sandstone and conglomerates from 1200 to 1400 ft. thick in e. Pennsylvania, but thins rapidly to the w., being only from 100 to 250 ft. thick in Ohio and Tennessee. In Arkansas the compact silicious rock known as novaculite, or Arkansas hone-stone, occurs in this member of the carboniferous series. The coal-measures proper occur in a very large part of the United States and Canada. First in importance is the Appalachian coal-field, covering about 60,000 sq.m. extending through parts of Pennsylvania, Ohio, Virginia, Kentucky, Tennessee, and Alabama. The maximum thickness of strata is from 2,500 to 3,000 ft.; 120 ft. near Pottsville, 62 ft. at Wilkesbarre, and 25 ft. at Pittsburg, showing a gradual diminution in a westward direction. The most persistent coal deposit is the Pittsburg seam, which is known over an area measuring 225 by 100 m., but with a thickness varying from 2 to 14 feet. The anthracite district of Pennsylvania occupies an area of about 650 sq.m. on the left bank of the Susquehanna. The strata between Pottsville and Wyoming, which belong to the lowest portion of the coal-measures, are probably about 3,000 ft. thick, but it is difficult to come at an exact estimate owing to the numerous folds and contortions. There are from 10 to 12 seams above 3 ft. in thickness; the principal one, known as the Mammoth or Baltimore vein, is 29 ft. thick at Wilkesbarre, and in some places exceeds even 60 feet. The Illinois and Missouri basin covers a considerable part of these states, as well as of Indiana, Kentucky, Iowa, Kansas, and Arkansas. Its area is estimated at 60,000 sq.m., the thickness varying from 600 ft. in Missouri to 3,000 ft. in w. Kentucky. The aggregate thickness of C. is about 70 feet. A good furnace C. is found in Indiana, the so-called block C. near Indianapolis, which, like the splint C. of Scotland and of Staffordshire, can be used in blast furnaces without coking. In Michigan a nearly circular area of coal-measures of about 5,000 sq.m. occurs in the lower peninsula between lakes Erie and Huron. The thickness is only 120 ft., and the C. is unimportant. There are also coal-bearing areas of less value in Texas and Rhode Island.

The carboniferous strata are largely developed in the e. provinces of the dominion of Canada, notably in New Brunswick and Nova Scotia. The lower carboniferous group here consists of about 6,000 ft. of red sandstones and green marls with thick beds of fossiliferous limestone, accompanied by gypsum. The overlying coal-measures, including the millstone grit, occupy an area estimated at 18,000 sq.miles. The whole thickness of this group in one place is about 14,750 ft., with 76 included coal-seams, together 45 ft. in thickness, which are contained in the middle division of the series. At Pictou there are six seams, together measuring 80 ft. in thickness. The coal-measures in this area approach nearer to the great coal-fields of Europe in thickness than those of the other American carboniferous districts. Rocks of the carboniferous age occur in various places on both flanks of the Rocky mountains, and in the Arctic archipelago, but they have not been explored. Lignite-bearing strata of cretaceous and tertiary age occupy a considerable area in the central and western portions of North America, especially in the

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Upper Missouri and Saskatchewan Valleys, in Utah, Texas, California, Oregon, and Vancouver Island. In the last locality for several years past, coal has been extensively mined near Nanaimo, on the east coast, in strata of the cretaceous age. Tertiary lignites are worked in Bellingham Bay, at Coosa Bay in Oregon, and at Monte Diablo near San Francisco. The lignite formations of the east flank of the Rocky Mountains, which are considered by Hayden to occupy a position between the cretaceous and the eocene tertiary strata, cover an area estimated at about 50,000 square miles within the United States, and extend north into Canada and south into Mexico.

In South America, coal, probably of the carboniferous age, is found in the Brazilian province of São Pedro, Rio Grande do Sul, Santa Catharina, and in the neighboring state of Uruguay. The largest area is that known as the Candiota coal-field, which is exposed for about 50 miles in the valley of the river of the same name. The sections exposed show five seams from 9 to 25 ft. each, or in all about 65 ft. of coal. Other basins are known at San Sepé, and San Jeronima, on the Jacahahay River. The latter is the only point at which mines are worked, as the coal, though thinner than that of other localities mentioned, is situated within the reach of navigable waters, needing a land carriage of only eight m. to the river.

On the west coast of South America cretaceous coal is worked at Lota in Chili, and at Sandy Point in the Straits of Magellan. In Peru both secondary and carboniferous coal is known at various points in the interior, the former occupying a position on the first rise of the Andes, while the latter occurs in higher ground, and at a greater distance from the coast. Good coal is also found at many points in the Santa Valley. Much of the Peruvian coal has undergone considerable disturbance and metamorphism subsequent to its deposition. At Porton, 45 miles east of Truxillo, a ridge of coal-bearing sandstones has been changed into a hard quartzite, with an interstratified seam of anthracite in a nearly vertical position. The coal is remarkable as containing a large amount of sulphur.

The annual production of coal throughout the world was roughly estimated for 1889 at 480,719,000 tons, including lignite and coal from formations newer than the coal-measures of Europe. Nearly one third of the total was mined in Great Britain. Excluding lignite, the figures for 1886–88 are as follows:

	Tons.		Tons.
Great Britain (1888)...	169,935,219	Russia (1886).....	4,576,500
United States (1888)...	132,731,608	Spain (1887).....	977,559
Germany (1888).....	65,386,000	Italy (1886).....	243,325
France (1888).....	22,952,000	Sweden (1887)...	300,000
Belgium (1888).....	19,185,000	Other Countries (1888)..	10,000,000
Austria and Hungary (1886)....	20,779,441	British N. America (1888)	2,658,184
		Chili (1888).....	1,000,000
New S. Wales (1888)..	2,922,497	Australia (1886).....	2,830,175

In America the first coal discovered was by Father Hennepin, near what is now Ottawa, Ill. The first mining of coal was in 1813, when five boat-loads of flinty coal were floated down the Lehigh River and sold in Philadelphia for $21 per ton. The fuel of the period was almost entirely of wood, Liverpool coal being a rare luxury. As late as 1821 only 22,122 tons of coal (Liverpool) were imported into the United States. The first regular shipments of coal from the Pennsylvania mines began in 1820. The coal industry of Pennsylvania has reached enormous proportions, the annual product being valued at over $78,000,000. Besides more than 57,000,000 tons of anthracite coal, there were mined in Pennsylvania about 50,000,000 tons of bituminous coal in 1895. Of bituminous coal the states of Ohio and Illinois produce the next most extensive yield, each about 15,000,000 tons annually. In 1895 the total production of coal in the U. S. was 89,948,699 tons of anthracite and 125,344,248 tons of bituminous. In 1820, the total coal product of Pennsylvania was less than 2,000 tons. It is now more than 75,000,000 tons per annum. See ANTHRACITE; APPALACHIANS.

COAL, a town in Northumberland co., Penn., where much anthracite is produced; contains the villages of Silver Hill and Scotch Hill. Pop. '90, 8616.

COAL-BEDS. See CARBONIFEROUS SYSTEM.

COALBROOK DALE, an English coal-field in the valley of the Severn, which supplies considerable quantities of coal and iron.

COAL-FISH, *Merlangus carbonarius*, a fish of the same family with the cod and haddock (*gadidæ*), and of the same genus with the whiting. It is not unlike the whiting in form, and in its fins, which, however, are not proportionally so large; but is of a very different color, the upper parts being nearly black. It attains, also, a much larger size, being often 2 or 3 ft. in length. It is celebrated among fishermen for its voracity; and is commonly found in large shoals, which, when attracted by bait, will keep near a boat till great numbers are taken. It is rather a coarse fish, but is much used in the northern parts of the world, both fresh and salted, or dried. It is found in the most arctic regions, even on the shores of Spitzbergen, and both on the European and American sides of the Atlantic. It is very plentiful on the British coasts, and in Scotland is generally known as the *sethe*. The fry are taken in great numbers by juvenile fishers stationed on rocks, and are called *podleys* on the e. and w. coasts of Scotland, *sillocks* and *cuddies*

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on some of the Scottish coasts, and *coalseys* in the n.e. of England. This fish forms an important part of the food of the Orkney and Shetland islanders.

CÖALI'TION, in politics, is applied to the union of two parties, or, as it generally happens, portions of parties, not of the same opinion, who yet agree to sink their differences, and act in common. Pitt the elder, when he took office in 1757, coalesced with the whig aristocracy represented by the duke of Newcastle. The ministry always spoken of, however, as the great C. was formed in 1782, when Fox, the leader of the reformers, took office along with lord North, the leader of the opposite party. When Mr. Gladstone in 1886 decided to advocate the cause of Irish home rule (q.v.) a large number of his followers seceded from the liberal party and formed a c. with the conservatives, taking the name of liberal-unionists (q.v.).

COAL-TAR. See GAS-TAR.

COAL-TAR COLORS. See DYE-STUFFS.

COAMINGS, in a ship, are small frame-works on the deck, to prevent sea and rain water from running down the hatchways, ladder-ways, and scuttles.

COAN, TITUS, D.D., b. Conn., 1801; ordained a Congregational minister in Boston in 1833, and in that year made a trip of exploration to Patagonia, where he wished to establish a mission. Circumstances being unfavorable, he returned, but soon afterwards he went to the Sandwich islands and was stationed as a missionary at Hilo. Besides his work as a missionary Dr. C. published in the *American Journal of Science* and elsewhere many valuable papers on scientific subjects. He d. 1882.

CÖAN'ZA, a river of Lower Guinea, western Africa, which, after a course of about 500 or 600 m., enters the Atlantic s. of St. Paul de Loando, in lat. about 9° 10′ s. It is navigable for a considerable distance, but a bar at its mouth renders it inaccessible save to small vessels.

COAST-DEFENSES. See FORTIFICATIONS.

COAST-GUARD, an English organization intended to prevent smuggling merely but now constituted so as to serve as a defensive force also. The old coast-guardsmen were in the employment of the customs department; they were posted along the shore at spots commanding extensive views of the beach, and were expected to be always on the look-out for smugglers. In 1856, the coast-guard was transferred to the admiralty, and under this arrangement the admiralty may, from time to time, issue orders for the augmentation of the coast-guard, not to exceed 10,000 men in all. Lands, not exceeding three acres each, may be bought by the admiralty for coast-guard stations. The coasts of the United Kingdom have been divided into 11 districts. Each district is under a navy captain, who has an iron-clad guard-ship at some port in the district. All the revenue cruisers and defense-gunboats are attached as tenders to the ships, and are manned therefrom. The able seamen, borne on the ships' books, and employed on shore in coast-guard service, are in three classes—chief boatmen, commissioned boatmen, and boatmen. They receive high sea-pay, besides 1*s.* 4*d.* per day in lieu of provisions, and house-rent and medical attendance free. In war-time, all of these men may be called upon to serve as regular sailors on board ship; but their families are allowed to live rent-free during this time. The coast-guard are taught naval gunnery, gunboat exercise, and the serving of land-batteries. The guard-ships are also employed as training-ships for the navy.

COASTING-TRADE, the commerce carried on by sea between the different ports of the same country. In Great Britain, "coastwise" is defined to mean "from any one part of the United Kingdom to any other part thereof." Vessels engaged in this commerce are subject to different rates and regulations from over-sea traders, and the masters must keep books showing that their cargoes come strictly within the definition of coasting-trade. Formerly, no goods or passengers were allowed to be carried from one port of the United Kingdom to another, except in British vessels; but this restriction was repealed in 1854, and the coasting-trade of Great Britain is now open to all the world. In other countries, the exclusive policy still prevails. The regulations under which the coasting-trade are conducted are contained in the customs consolidation act.

Owing to our length of coast, this trade in the United States is far more extensive than in any other country. Of the forty-four states now in the union, eighteen border on the Atlantic ocean and the Gulf of Mexico, and three border on the Pacific Ocean, to which may be added the enormous coast-line of the newly acquired territory of Alaska. There is an immense amount of coastwise trade, especially along the Atlantic and the gulf. In the time of the early settlements such trading was done in small shallops, sloops, and schooners, and there was very little of it. The introduction of steam-vessels made a great change, and the trade rapidly grew in importance. At the present time many hundreds of steamers and more hundreds of sailing craft are constantly plying from Maine to Texas, transferring the cotton, sugar, and rice of the southern to northern, and the lumber, grain, and manufactured goods of the northern to southern markets. The swift propeller brings the oranges and strawberries of Florida

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to Maine, and takes back the ice of the Penobscot. In summer, these coasting steamers do a large share of the passenger as well as trade traffic. The thoroughness of the coast survey, and the recent introduction of the weather service whereby mariners are duly forewarned of danger, have done much to prevent the disasters which were common not long ago, and even the dreaded cape Hatteras has lost much of its terror.

COAST-LINE, the ocean boundary of any continent, island, or section of land. Such lines vary in length with the amount of indentation by gulfs and bays. Europe has nearly 20,000 m. of coast-line; Africa, 15,000; Asia, 30,000; North America, 23,000, and South America, 15,000.

COAST RANGE, or Coast Mountains, in California, running in a course almost parallel with the ocean from near the boundary of Oregon into Lower California. The range has a width of 30 to 40 m., and has numerous spurs which usually run toward the ocean. Between these are well-watered and exceedingly fertile valleys. The chief peaks of the range are San Bernardino, 11,600 ft.; Helena, 3,700. The principal passes are from 686 to 3,780 ft. above sea level. The mountains are usually rocky and steep. Those near the sea are covered with timber, while those far inland are nearly bare.

COAST SURVEY, a scientific department of the government of the United States, established for the purpose of making geodetic and hydrographic surveys to determine the coast-line, and of making charts of harbors and tide-waters, and of the bottom of the ocean along the coast. It extends its observations to all parts of the globe, as may be thought serviceable to navigation; and it makes such other observations (as of the tides and currents, and of the nature of the sea and river bottoms) as will permit calculations of changes to be expected in the future. Its office is also to indicate positions for the erection of light-houses and all other useful signals, and to make various meteorological and other observations. The inception of the organization was contemplated in the message of President Jefferson to congress in 1807. An act was passed authorizing him to cause a survey of the coasts of the United States, including islands, shoals, and places of anchorage within 20 leagues of the shore, and of St. George's bank; and to take soundings and observations upon currents beyond such limits, to the gulf stream. This act appropriated $50,000 for the object. Plans were requested from scientific men, and that proposed by Mr. F. R. Hassler, a native of Switzerland, was adopted. It was, in the first place, to determine the positions of certain prominent points of the coast by astronomical observations, and to connect them by trigonometrical lines from which to make a nautical survey; but nothing was done till 1811, when he went to Europe to obtain instruments and material for the work. He was, however, detained till the close of the war with Great Britain. On his return he was appointed superintendent of the coast survey, but did not begin active labors till 1817, when, in the vicinity of New York, he measured a base-line west of the Palisades on the Hudson, for the triangulation of New York harbor; but the work was not extended beyond this, for want of funds, except that a few detached surveys were made by the navy, and by the topographical engineers of the army. An interval of ten years elapsed, and in 1832, after a small appropriation had been made by congress, Mr. Hassler resumed the active duties of his office, and was authorized to employ, in addition to the naval and army officers designated for that service, such astronomers and other persons as he might deem necessary. He continued to superintend the survey till his death, in 1843. The work which he accomplished was to extend the survey at New York as far eastward as Point Judith, R. I., and as far s. as cape Henlopen, Del. The triangulation extended over an area of 9,000 sq. m., determining the positions of about 1200 stations, to be used in the delineation of about 1600 m. of shore line. Mr. Hassler was succeeded by prof. A. D. Bache. In 1845, surveys were begun on the coasts of Virginia and North Carolina, and during the next two years they were extended to Georgia and the gulf states, and afterwards to the Florida reefs and keys. Many observations on the gulf stream were taken during the time of the superintendency of Prof. Bache, and extended observations were made upon the tides and currents in various rivers, for the purpose of deducing the laws by which they are governed. The magnetic force and direction in parts of the earth included in the survey were observed, and various meteorological observations were taken for the purpose of investigating the laws of storms. The civil war interrupted the operations of the survey along the coast of the southern states, but many of the coast-survey officers were with the United States vessels, and their knowledge was of the utmost importance in naval operations. Two years after the close of the war, Prof. Bache died (1867), and Prof. Benjamin Pierce, of Harvard university, was appointed his successor. Since then a more comprehensive system has been prosecuted, extending across the continent; and the Pacific coast has been the subject of extended triangulation, although still far from complete; and the hydrographic survey has been actively carried on. See Hydrography, Geodesy, and Triangulation.

COAST VOLUNTEERS, or Royal Naval Coast Volunteers, was a corps organized for the special defense of the coasts of the United Kingdom, separate from, but in connection with the coast-guard (q.v.). By an act of parliament passed in 1853, the admiralty was empowered to raise a number, not exceeding 10,000, of C. V., to consist of sea-faring men and others, to be entered for five years' service, and to be exercised 28 days in each year, either on shipboard or on shore; but not to be sent more

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than 50 leagues from the coasts of the United Kingdom, unless in cases of emergency, when the distance might be extended to 100 leagues. One year's active service entitled them to discharge in ordinary cases; but in emergencies, they might be called out a second year on receipt of higher pay. Their pay, allowance, and rank during exercise and active service was the same as able seamen's. The bounty to be paid on entering, and the arrangements for arms, clothing, and accoutrements, were left for the admiralty to settle from time to time. An act passed in 1875 invested the command of the C. V. in the coast-guard, the officers of which were to superintend the training and exercising. As a matter of fact, the force was a very small one (600), and a failure; and was ultimately abolished.

COAT OF ARMS, in the military trappings of the middle ages, held the place of the *paludamentum* of the ancient Roman captains. It was a coat worn by princes and great barons over their armor, and descended to the knee. It was made of cloth of gold or silver, of fur or of velvet, and bore armorial insignia. The "coat of arms," as understood by heraldry in the present day, is nothing more than a relic of the ancient armorial insignia, divested of the coat on which it used to be embroidered. See SHIELD, HERALDRY.

COATBRIDGE, a rising and prosperous town of Scotland, in northwest Lanarkshire, about 9 m. directly e. of Glasgow, and 2 m. w. of Airdrie. There are churches, academies and other schools, banks, etc. The town is in the center of a mineral district, and contains malleable-iron works, and many other works connected with the iron manufacture. C., owing to the great increase in the iron trade, has grown very rapidly in size and prosperity. Pop. '41, 1,599; '51, 8,564; '61, 10,501; '81, 17,500; '91, 29,996.

COATI, or COATI-MONDI (*nasua*), a genus of quadrupeds of the family *ursidæ* (the bear family); by some naturalists referred to *viverridæ* (the civet family), although their *plantigrade* character allies them rather to the former. They are most nearly allied to the raccoons, and, like them, are exclusively American. They are chiefly remarkable for the elongation of the snout, which is a sort of flexible proboscis, and is turned about in search of food, and employed in rooting up the earth to obtain worms and insects. They are often domesticated in South America, and are very affectionate, active, troublesome, and amusing. See illus., DEER, ETC.

COAT OF MAIL, in the armor of the middle ages, was a suit made of metal scales or rings, linked one within another. See ARMOR.

COATZACOAL'COS, a river of Mexico rising in the Sierra Madre, flowing partially across the isthmus of Tehuantepec, and emptying into the gulf of Mexico. This river, and the region around, have been several times explored with the view of constructing a canal across the isthmus from the gulf to the Pacific, the river being considered an important element in the work. Its length is about 150 miles.

COBALT (from *Cobalus*, a malicious sprite or gnome) is a metal of no use in the arts and manufactures, but which forms compounds of commercial importance. C. (symbol Co) is found naturally in combination with arsenic, iron, and nickel, as *speiss C.*, $(CoNiFe)As_2$; in combination with arsenic, iron, and sulphur, as *C. glance*, the arsenide and sulphide of C. $(CoFe)(AsS)_2$, in ores of nickel (q.v.); and in the metallic state, it is found in meteoric stones or aërolites (q.v.). The metal has been obtained in laboratory experiments, and presents a gray color with a reddish tinge, is highly magnetic, and is as hard and infusible as iron. It is a brittle metal, and forms no alloys of commercial use. The protoxide of C. (CoO) is employed in painting on porcelain, for producing a rich blue color. *Zaffre* is the impure oxide obtained by partially mixing C. ore with two or three times its weight of fine sand. *Smalt* is the term applied to a deep blue glass, which owes its color to the presence of a silicate of C., and which, when reduced to a very fine powder, is employed occasionally by laundresses to correct the yellow color of newly washed linen, and by paper-makers as a blue pigment for staining writing-paper. Smalt is also used in the production of the blue colors in porcelain, pottery glass, encaustic tiles, fresco painting, etc., and forms the principal ingredient in *old Sevres blue*, *Thenard's blue*, *turquoise blue*, and *variegated blue*. See BLUE. A compound containing the oxides of C. and zinc is of a beautiful green color, and is known as *Rinman's green*. The chloride of C., dissolved in much water, may be employed as a sympathetic ink. In dilute solutions, it is of a faint pink color, which is not observable when it is used for writing upon paper; but when heated before the fire, it loses water, and becomes blue, and the writing is then capable of being read. On allowing the paper thereafter to lie in a damp place, or exposing it to the vapor of steam from a kettle, water is again absorbed, and the writing returns to its invisible state. The addition of a little perchloride of iron to the ink, makes the writing appear green; a solution of zinc imparts a red tint; and a salt of copper, a yellow shade.

COBAN, a town in Guatemala, capital of the department of Alta Vera Paz and about 90 miles n. of the city of Guatemala. It is built on the slopes of a hill and contains a cathedral. Near by chalk is mined and manufactured into crayons. It was founded in the 16th century and was the centre of the Dominican mission. It has a population of about 27,700.

COBB a co. in n.w. Georgia on the Chattahoochee river, intersected by the Western and Atlantic and the Atlanta, Knoxville and Northern railroads; 379 sq. m.; pop. '10.

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22,286, includ. colored. Surface hilly and in part mountainous, soil fertile. Gold has been found. The main products are wheat, corn, cotton and butter. Co. seat, Marietta.

COBB, HOWELL, 1815–68; b. Ga., graduated at Franklin college, and admitted to the bar in 1836. In 1843, he was sent to congress, where he served until 1851. In 1849, he was elected speaker of the house. He was one of the leaders of the southern party in congress, and favored the extension of slavery into the territory acquired from Mexico. In 1851, he was chosen governor of Georgia, and again to congress in 1855. He was secretary of treas. in Buchanan's cabinet, resigning Dec., 1860, to join the south in the approaching war. He was the first president of the confederate congress, and afterwards a maj.gen., but made no military reputation.

COBB, SYLVANUS, D.D., 1799–1866; b. Me.; a minister in the Universalist church. He edited a newspaper for 20 years, and wrote a *Commentary on the New Testament*, and other works. His name is more widely known through the literary work of his son Sylvanus, 1823–87, a prolific writer of tales and sketches.

COBBE, FRANCES POWER, b. 1822; an English authoress, a great-granddaughter of Charles Cobbe, archbishop of Dublin. She became interested in religious studies, and was for a long time a personal friend and admirer of Theodore Parker, editing the English edition of his works, and being with him at Florence in the last days of his life. She traveled in Italy and the east, giving her observations in the *The Cities of the Past*. Among her other works are *Studies New and Old of Ethical Subjects; Hours of Work and Play; Essay on Intuitive Morals; Religious Duty; Darwinism in Morals, and other Essays; The Scientific Spirit of the Age; Life of Frances Power Cobbe* (1894), etc. She is noted for fluency and force of style.

COB'BETT, WILLIAM, a celebrated English political writer, was b. in Mar., 1762, at Farnham, in Surrey, where his father was a small farmer. From his infancy, he was trained in habits of industry and self-dependence. Taking a dislike to rural occupations, he went to London, where he was employed a few months as a copying-clerk—a kind of employment so distasteful to him, that he enlisted into the 54th foot, and with it went out to Nova Scotia shortly after. In this regiment he remained about eight years, in the course of which time his uniform good conduct, activity, and intelligence had secured him the high promotion of sergeant-major. During his soldier-years, he indulged in none of the dissipations common to barrack-life, but devoted the whole of his leisure to the work of self-education. On his return to England, about the end of 1791, he obtained his discharge, married, and went to America in the following year. He settled in Philadelphia, where he commenced his career as a political writer. Under the signature of "Peter Porcupine," he was at this early stage as keen a tory as in later life he was a radical, and he lashed French republicanism and American democracy with a scorn as coarse and personal sometimes as it was always bitter. In America, he was twice prosecuted for libel. He left America in June, 1800, and returned to England. In Jan., 1802, appeared the first number of his famous *Weekly Political Register*, which he continued without intermission until his death in 1835. At first, tory, the *Register* gradually changed its politics, until at last it became the most fierce and determined opponent of the government, then presided over by Pitt, and the most uncompromising champion of radicalism. In 1810, having previously been twice tried and found guilty of libel on certain members of the government, he was sentenced to imprisonment for two years in Newgate, and to pay a fine of £1000, for having in the *Register* made some severe remarks upon the flogging of five militiamen. In 1817, in consequence of pecuniary embarrassments, and the dread of being sent to Newgate again, under the six acts for the suppression of freedom of discussion, C. went once more to America, where he remained more than two years, his articles for the *Register* being transmitted with unfailing regularity across the Atlantic. In 1829–30, C. delivered political lectures in several of the principal towns of England and Scotland, and everywhere met with a most enthusiastic reception as the boldest and most powerful advocate of the people's rights. In 1832, he was returned to the first reformed parliament as one of the members for Oldham. His speeches in parliament, however, did not add to his reputation. He died June 18, 1835. Among C.'s best known works are his *English Grammar; Rural Rides; Cottage Economy; Advice to Young Men and Women;* and *Parliamentary History*. C. was by no means a man of the first order of intellect; he was shut out altogether from the higher and more refined departments of human thought. But in dealing with matters of common-sense merely, he exhibited a native vigor far surpassing that of any writer of his day. Nor can there be any doubt that, in spite of his crotchets, he rendered lasting service to the cause of the people. See Smith's *Life of C.* (1878).

COBDEN CLUB, an association of leading free-traders instituted in London, 1866, in honor of Richard Cobden, with the object of diffusing in all parts of the world those principles with which his name is connected. For this purpose it has published tracts, pamphlets and books, for free circulation, especially in Great Britain, the U. S., and the British colonies. Its headquarters are in London. The advocates of a protective tariff in the U. S. assert that it has made efforts to establish free-trade in this country, through the hiring of speakers and circulation of tracts, which have been not without influence in certain elections. Its publications are very numerous.

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COB'DEN, RICHARD, an eminent English politician, who was very aptly designated 'the apostle of free-trade," was b. at Dunford, near Midhurst, Sussex, in 1804. His father, who was the owner of some little property, which he cultivated himself, died while the subject of this article was yet young, leaving his family in comparatively poor circumstances. Richard was received into a wholesale warehouse belonging to his uncle, where he soon exhibited great aptitude for business. After some time, he became a partner in a Manchester house, his presence here being speedily made manifest by the superior quality and tastefulness of the printed calicoes of the firm. In 1834–35, C. traveled in Turkey, Greece, and Egypt, and also visited the United States, the result of his travels appearing in two pamphlets, entitled respectively *England, Ireland, and America,* and *Russia;* the latter intended as an antidote against the "Russophobia" then prevalent. In these pamphlets, he also ridiculed the workings of diplomacy, and asserted England's mission to be the avoidance of war and the extension of commerce. In 1837, he contested unsuccessfully, on free-trade principles, the borough of Stockport; and in 1838 he carried in the Manchester chamber of commerce a motion to petition parliament for the repeal of all duties on corn. This was followed by similar action all over the country; and in the following year, petitions bearing some two millions of signatures for the repeal of the corn-laws were carried to London by 200 delegates. The motion of Mr. Villiers for repeal being rejected by a large majority of the house of commons, the friends of free-trade determined to form the anti-corn-law league (q.v.), of which C. became the most active and prominent member. To his lectures all over the country, and his speeches in parliament (to which he was returned in 1841 by the constituency which rejected him in 1837), all characterized by great information, clearness, and acute and convincing reasoning, was in great part due, as sir Robert Peel acknowledged, the abolition of the corn-laws at so early a period as 1846. Having accomplished this great work, C. again visited the continent, and during his absence he was elected both for Stockport and the West Riding of Yorkshire. He chose the latter constituency, which he continued to represent till 1857, when, on an appeal to the country by lord Palmerston to support him in his Chinese policy, of which C. was a strenuous opponent, he was rejected. Shortly after the repeal of the corn-laws, the public testified its gratitude to him for the services he rendered in this matter by subscribing for him a magnificent testimonial of between £60,000 and £70,000. C. now gave up business, and devoted himself exclusively to politics. He continued to labor assiduously for the extension of free-trade principles, for parliamentary and financial reform, for repeal of the taxes on knowledge, and was particularly earnest in enunciating national and international peace views; and to this feeling with regard to war, he owed his rejection at the general election of 1857. In 1859, having in the interval, on account of ill health, retired from politics altogether, he was, during his absence in America, elected for Rochdale. Lord Palmerston, who was at this time called upon to form a new ministry, with a just appreciation of the great services which C. had rendered to his country, offered him a seat in the cabinet, which C., as the uncompromising opponent of the noble lord's foreign policy, felt bound to decline. After his election for Rochdale, the state of his health did not permit him to take any part in parliamentary proceedings, but as her majesty's plenipotentiary, he (1859–60) arranged and concluded a treaty of commerce with France. C. spoke out strongly in favor of the north during the American civil war. He died April 2, 1865.

COBET, CARL GABRIEL, a learned Dutch Hellenist, born at Paris in 1813, studied at Leyden, next made a long archæological journey at government cost, and settled in 1847 to a chair at Leyden. One of the most sagacious and acute of modern critics in the department of Greek scholarship, Dr. Cobet published many books and papers of the highest value. These include *Oratio de Arte Interpretandi* (1847); collections of *Varioe Lectiones* and *Miscellanea;* works on the comic poet Plato, Dionysius of Helicarnassus, and Xenophon; and editions of Diogenes Laertius, Xenophon's *Anabasis* and *Hellenica,* Lysias and Cornelius Nepos (1881). He died in 1889.

COBI'JA, once a seaport of Bolivia, but ceded to Chili by the treaty of 1883. It is situated in lat. 22° 34′ s., long. 70° 21′ w., and forms the capital of the department La Mar. It has a small population, and its trade inconsiderable, for, besides the disadvantage of an open roadstead to seaward, there extends inland the almost impracticable desert of Atacama.

COBI'TIS. See LOACH.

COB'LE, or COB'BLE, is a low flat boat with a square stern, mostly used by salmon-fishers.

COBLENZ, a city of Rhenish Prussia, beautifully situated at the junction of the Rhine and the Moselle, the former of which is here crossed by a bridge of boats, and the latter by a fine stone bridge. Being a bulwark of Germany against France, C. is defended by extensive fortifications, forming a fortified camp capable of affording accommodation for 100,000 men. For defense-purposes, C. is connected with the almost impregnable castle of Ehrenbreitstein (q.v.), on the opposite side of the Rhine. Several detached forts also guard the city at various points. In the old town of C., many of the streets are irregular, narrow, and dirty; but in the new town they are generally well built, moderately wide, and cleanly. Among its principal buildings are the church of St. Castor, founded early in the 9th c.; the town-hall; the old castle of the electors of

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Treves, repaired in 1845; and the old Jesuit college, now a *gymnasium*. The favorable position of C. secures it an active commerce in wine, corn, mineral waters, etc. It manufactures machinery, japan-ware, etc. Many of the inhabitants are employed in vine culture. Pop. '90, including a garrison of about 4,600 men, 32,671. C. was known to the Romans as *Confluentes*. Till 1796 it belonged to the elector of Treves. In 1798 it was made the capital of the new French department Rhine-Moselle, and in 1815 was given to Prussia. See illus., GERMANY, vol. VI.

COB-NUT, a name given to some of the largest and finest cultivated varieties of the hazel-nut (q. v.).—In the West Indies, the name cob-nut is given to the fruit of *omphalea triandra*, a tree of the natural order *euphorbiaceæ*. It is also called hog-nut. The tree has a white juice, which turns black in drying, and in Guiana is used instead of ink. The fruit is a three-celled capsule, each cell containing one seed or nut, which, if the embryo is retained, has very cathartic properties.

COBOURG, a town and co. seat of Northumberland co., Ontario, Canada, on lake Ontario and the Grand Trunk railroad; 69 m. n.e. of Toronto; pop. '91, 4829. It is a port of entry and a market town of much importance, and has woolen mills, car factory, and foundries.

CO'BRA DA CAPEL'LO, a name sometimes limited to the *naja tripudians*, and sometimes extended to all the species of the genus *naja*, very venomous serpents of the family *viperidæ*, remarkable for the faculty of dilating the back and sides of the neck, which they do when angry or otherwise excited, and to which they owe their popular name, originally Portuguese, and signifying *hooded snake;* the elevated skin of the back of the neck presenting, when the animal is viewed in front, much the appearance of a hood. It is usually three or four feet long, of a pale rusty-brown color above, and bluish or yellowish-white below, and is characterized by a singular mark on the back of the neck, closely resembling the figure of an old-fashioned pair of spectacles, from which the animal sometimes receives the name of the *spectacle snake*. The C. da C. preys on lizards and other small animals. It is usually a sluggish creature, and is easily killed, even by means of a small stick or a whip. Its venom is extremely powerful, its bite causing death in two hours or less. Yet it is little disposed to use its fangs, except for the purpose of providing itself with food. The C. da C. is often to be found in the vicinity of human dwellings in the East Indies, and even in the houses themselves, attracted apparently by the young of the domestic poultry, and by the moisture of the wells and drainage. When one is found in or near a house, its mate is seldom far off. The Singhalese, when obliged to leave their houses in the dark, carry a small stick with a loose ring, the noise of which, as they strike it on the ground, warns the snakes to leave the path. The poison of the C. da C. is secreted in a large gland in the head of the serpent, which, when the animal compresses its mouth upon any object, flows through a cavity of the tooth into the wound. The poison, though most deadly when introduced into the system through a wound, possesses the curious property of being perfectly harmless if taken internally. Olive oil applied externally, and ammonia taken internally, cauterizing, and ligatures immediately applied, may save the life; but the poison is so deadly, that instances of recovery of bitten persons are very rare. See Buckland's *Curiosities of Natural History*, and Fayrer's *Thanatophidia of India* (Lond.: Churchill). The other species of *naja* are found in the warm parts of Asia, Africa, and Australia. See illus., REPTILES, ETC., vol. XII.

CO'BURG, a t. of Central Germany, in the duchy of Saxe-Coburg-Gotha, picturesquely situated on the left bank of the Itz, a tributary of the Regen, in lat. 50° 15′ n., and long. 10° 58′ east. In the market-place are some striking old buildings, but the general appearance of the houses is one of cleanliness and comfort. C. is one of the chief ducal residences, and the palace, a Gothic edifice, erected in 1549, is one of the principal buildings in the town. The old castle of the dukes of Coburg, now partly used as a house of correction and prison, occupies a commanding height more than 500 feet above the town. The rooms, and the bed which Luther occupied when in concealment here in 1530, are still exhibited to the visitor, as well as the pulpit from which he preached in the chapel of the castle. During the thirty years' war, the castle was ineffectually besieged by Wallenstein. C., which is the seat of all the high courts of the duchy, has extensive manufactures, and exports beer. Population, '95, 18,689.

COBURG FAMILY, a German ducal family dating from the 15th c., remarkable for alliances with the English and continental royal houses. Queen Victoria's mother was a sister of duke Ernest I. The first wife of Ernest's brother Leopold (king of Belgium) was a daughter of George IV. of England, and his second wife was a daughter of Louis Philippe. Albert, the son of Ernest I., was the husband of Victoria.

COBURG PENINSULA, the most northerly part of Australia to the w. of the gulf of Carpentaria, runs out in a n.w. direction towards Melville island, from which it is divided by Dundas strait. On its n.e. side is the bay known as Port Essington, at the head of which, about lat. 11° 22′ s., long. 132° 10′ e., was established, in 1839, the settlement of Victoria—abandoned, on account of its insalubrity, six years thereafter.

CO'CA, *Erythroxylon coca*, a shrub of the natural order *erythroxylaceæ*, of which the leaves are much used by the inhabitants of Peru and Bolivia as a narcotic and stimulant.

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The dried leaves are chewed with a little finely powdered unslaked lime, or with the alkaline ashes of the quinoa (q.v.), or certain other plants. An infusion is also occasionally used. The properties and effects of C. resemble those of opium, although it is less narcotic, whilst it possesses the property of dilating the pupil of the eye, which opium does not possess. It also lessens the desire for ordinary food, and for some time, at least, enables the person who uses it to endure greater and more protracted exertion than he otherwise could, and with less food. It is especially remarkable for its property of preventing the difficulty of respiration, so common in the ascent of long and steep slopes at great elevations. But when used habitually and in excess, it weakens the digestion, produces biliary and other disorders, and finally induces a miserable ruin both of body and mind. It has been in use from a very remote period among the Indians of South America, and was extensively cultivated before the Spanish conquest. Many of the Indians of the Peruvian Andes are to this day excessively addicted to it, and its use is quite general among them, besides prevailing to a considerable extent among the other inhabitants of the same regions. Its culture and use have extended into Brazil. See COCAINE.

COCAIGNE. See COCKNEY.

COCAINE, an alkaloid derived from coca leaves ; the hydro-chlorate produces insensibility in mucous surfaces, but has no bad effect on the epidermis. Its special value as an anæsthetic, when applied to the eye, was discovered in 1884, by Dr. Koller, in the hospital of Vienna. C. seems destined to supplant ether in all surgical operations on the eye. Its application is entirely harmless. The effect lasts about 20 minutes and has no unpleasant sequels. The curative properties of cocaine have not yet been decided.

COCCE'II, HEINRICH FREIHERR VON, b. at Bremen, Mar. 25, 1644, studied jurisprudence and philosophy in Leyden from 1667 to 1670, and went from thence to England. In 1672, he was made professor of the law of nations at Heidelberg; in 1689, he accepted the professorship of jurisprudence at Utrecht; and, in the following year, was appointed to a similar office at Frankfort-on-the-Oder. In 1713, the emperor named him a baron of the realm, on account of his good management of several important affairs. C. died Aug. 17, 1719. As an erudite jurist, C. was the oracle of many courts, and his work on German civil law (*Juris publici prudentia*, 1695) was almost universally used as an academical text-book for this branch of jurisprudence.— His youngest son, SAMUEL, 1679–1755, b. at Heidelberg, acquired no less renown.

COCCE'JUS, or **COCK, JOHANNES,** a distinguished theologian, was b. at Bremen, Aug. 9, 1603. After preparatory studies in his native place, he, in 1625, went to Hamburg, where he studied Hebrew. From thence he went to Franeker in 1629. Returning to Bremen in 1630, C. was appointed professor of Hebrew at the athenæum of his native place; called to Franeker for the same office in 1636, and in 1648 appointed professor of theology also. In 1650, he became professor of theology at Leyden, where he died in 1669. C.'s chief work is the *Lexicon et Commentarius Sermonis Hebraici et Chaldaici Veteris Testamenti* (Leyden, 1669) the first tolerably complete dictionary of the Hebrew language. The irrelevant and inaccurate matter which it originally contained, has been weeded out in the course of time by more skillful editors. In spite of his great learning, C. held very peculiar hermeneutical principles, which enabled him to discover the whole New Testament in the Old. The result, of course, was that he virtually transferred the language of the Old Testament to the New. The representation abundantly employed in the former of a covenant between God and man, usurped the place of the New Testament doctrine of the Fatherhood and Sonship; and his theology is simply a modern renewal of the old attempt to Judaize Christianity, which Paul denounced and condemned. C. carried the covenant theology, as it is called, to an absurd extreme. The most complete exposition of his views is in his *Summa Doctrinæ de Fœdere et Testamento Dei* (1648). C.'s principal antagonists were Voetius and Desmarets.

COCCINEL'LA. See LADY-BIRD.

COC'CO, CO'COA ROOT, or ED'DOES, plants of the genus *colocasia*, and of the nearly allied genus *caladium*, of the natural order *araceæ*, very generally cultivated in tropical and sub-tropical countries for their roots, or flat underground corms, which abound in starch, and are used as articles of food, being deprived by roasting or boiling of the characteristic acridity of the order, which, indeed, some of them possess in a comparatively small degree. They are sometimes included under the name *yam*, but are totally different from the true yams. The names cocco, cocoa root, and eddoes, perhaps more strictly belong to *colocasia antiquorum*, a stemless plant with ovate leaves, and flowers inclosed in a cylindrical erect spathe. The taste of its roots is like that of potatoes. *Colocasia esculenta* is a similar plant, a native of tropical America, and is much cultivated. *Colocasia macrorhiza* is the tara (q.v.) of the South Sea islands. In the Himalaya, *C. Himalensis* forms the principal food of many of the inhabitants. The root in its recent state is stimulant, diaphoretic, and expectorant.

COC'COLITHS, AND COCCOSPHERES, bodies called "bathybius" by Huxley. They are round, or nearly so, and adhere to gelatinous protoplasm found in submarine localities. Prof. Huxley divides the coccoliths into discoliths and cyatholiths, and de-

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scribes the discoliths as "oval discoidal bodies with a thick, strongly refracted rim, and a thinner central portion, the greater part of which is occupied by a slightly opaque cloud patch, corresponding to the inner edge of the rim, from which it is separated by a transparent zone;" usually they are concave on one side and convex on the other, the rim being raised on the convex side. In diameter they are one five-thousandth of an inch. The cyatholiths are a little larger, and of the shape of minute studs or buttons. Coccospheres are either compact or loose in texture, and vary from a thirteen-hundredth to the 760th of an inch in diameter. Dr. Wallich thinks that the coccospheres are the progenitors of the coccoliths; and both are the calcareous parts of bathybius. They are found fossil in chalk.

COCCOLOBA. See SEASIDE GRAPE.

COCCOMIL'IA, or COCUMIGLIA, *Prunus coccomilia*, a species of plum, a native of Calabria, and of which the bark—particularly of the root—is much used in that country for the cure of intermittent fevers. Its valuable qualities have been strongly attested by Neapolitan physicians, and it is employed both in private practice and in military hospitals, but it has not come into use in other countries. The C. has obovate leaves, short double flower-stalks, and austere tawny-yellow fruit.

COCCOS'TĔUS, a genus of fossil fishes, peculiar to the Devonian measures. It was nearly related to cephalaspis (q.v.), but differed in having, in addition to the bony helmet of that genus, a cuirass covering both the dorsal and ventral aspects of the body as far down as the origin of the dorsal fin, from which to the tail—comprising more than one half the entire length of the animal—all seems to have been exposed without the protection even of a scale. In a well-preserved specimen in the British museum, the remains of the endo-skeleton can be detected. Seven species have been described from the bituminous schists of the old red sandstone of the north of Scotland.

COCCOTHRAUS'TĒS. See HAWFINCH.

COC'CULUS IN'DICUS, the name given commonly, and in the pharmacopœias, to a very poisonous seed, brought from the East Indies, which is used for various medicinal purposes, and illegally in the preparation of malt liquors. It possesses acrid and intoxicating qualities. It is used in India for stupefying fish, that they may be taken by the hand. An ointment made with it is a very efficacious remedy for ringworm. It contains a most poisonous principle, called *picrotoxine*, whilst the pericarp contains another called *menispermine*, equally poisonous. It is the seed of the *anamirta cocculus*, a beautiful climbing plant, of the natural order *menispermaceæ*. It imparts to beer its bitter taste, and at the same time a fullness and apparent richness, but renders it very deleterious in its effects. It has been frequently asserted that C. I. is used to a considerable extent by British brewers, but according to the report of the laboratory department of the inland revenue office issued in 1876, there is little ground for this belief, as in no case were the officers of the department able to discover the drug in any brewer's premises, or in any samples of beer. Of the large quantity imported, almost the whole is again exported, chiefly to Germany.—The genus *anamirta* is closely allied to the genus *cocculus* (see CALUMBA), in which it was formerly included. The fruit of several allied species possesses properties analogous to those of the *A. cocculus*.

COC'CUS (Gr. *kokkos*, kermes), a genus of insects of the order *hemiptera*, sub-order *homoptera*, the type of a family, *coccidæ*, allied to the *aphis* (q.v.) family, although in many respects very distinct. The *coccidæ* are sometimes called *scale insects*, and by the French *gallinsectes* (Latinized by some entomologists into *gallinsecta*), but they are not to be confounded with the insects called gall-flies (*cynipidæ* or *gallicolæ*), which produce *galls* or nut-galls. The *coccidæ* are very numerous, and are attached to particular plants, on the juices of which they feed, often producing much mischief by the flow and loss of sap which their punctures occasion, and giving great trouble to gardeners, who find it very difficult to free their plants, particularly in hot-houses, from the *scale*, the *mealy bug*, the *vine-gall*, etc. Various washes, consisting of soap, sulphur, tobacco, etc., are employed for this purpose; but moist heat, or as much exposure to steam as the plant can bear, has been found in many cases the most efficacious remedy. The destructive coffee-bug belongs to this family. The male *coccidæ* are winged insects, having only two wings, which shut horizontally upon the body; the abdomen is terminated by two threads. The females are wingless. It is not well known how the males subsist, as they have no apparent organs for sucking juices or eating any sort of food. The females have a beak, which they insert into plants in order to suck their juices. This interesting family of insects contains not only many troublesome species, but some which are of great value, particularly for the beautiful dyes which they yield. These dyes are obtained from the bodies of the female insects. Among them are cochineal (q.v.) and kermes (q.v.). A species of C. (*C. Polonicus*), which lives on the roots of the knawel (*scleranthus perennis*), yields the SCARLET GRAINS OF POLAND, a considerable article of commerce before cochineal was introduced into Europe; and a species which feeds on the roots of the burnet (*poterium sanguisorba*), was in like manner used by the Moors for dyeing silk and wool of a rose color. Other species produce lac (q.v.) and wax. See WAX INSECT.

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COCCY'ZUS. See CUCKOO.

COCHABAM'BA, the name of a city and of a department in Bolivia. The city lies in a plain at the base of the Andes, about 130 m. s.e. of La Paz, and is one of the chief cities of the Bolivian republic, containing about 25,000 inhabitants. It has a temperate and healthy climate, and is engaged in the manufacture of cotton fabrics, woolens, pottery, etc. The department, of which the city just described is the capital, has an area of 21,417 sq. m., and a population (1893) of 360,270. In addition to the precious metals, it yields cotton, timber, cereals, and coca.

COCHIMI, a tribe or race of Indians in the peninsula of lower California, of whom only a few survive. They say their ancestors were driven southward by other Indian nations after a general war. The Jesuits established missions among them early in the 18th c., but the missions were suspended after the expulsion of the order.

CO'CHIN, a protected state of Hindustan, under the presidency of Madras, lat. 9° 48′ to 10° 50′ n., long. 76° 5′ to 76° 58′ e. With Malabar on its n.w. and n., and Travancore on its e. and s., it fronts the Arabian sea on the s.w., and meets Coimbatore towards the n.e. on the water-shed of the western Ghauts. It contains 1361 sq. m., and a pop. ('91) of 723,000. Its hydrography is singular. The western Ghauts, which have here an elevation of fully 4,000 ft. intercept the s.w. monsoon, and render the coast one of the most humid regions in the world during June, July, August, and Sept.; while even during the remaining eight months, anything like an unremitting drought is unknown. As the space between the mountains and the sea is almost on a level with the tide, the countless streams have each two contrasted sections — the plunging torrent that breaks into comparatively short pieces the magnificent trunks of teak with which it is freighted; and the sluggish brook which, however it may vary, according to the season, in breadth and depth, pretty uniformly results in a brackish estuary. Further, these estuaries, almost continuously breasted by a narrow belt of higher ground, form between them a backwater or lagoon of 120 m. in length, and of every width between a few hundred yards and 10 m., which communicates at only three points with the ocean. The cocoa-nut is the most valuable product of the country; besides this tree, however, the forests produce red cedar, anjelly teak, benteak, and many other hard woods, but these are now becoming very scarce. The low country produces rice, pepper, cardamoms, ginger, betel-nut, yams, arrow-root, and sweet potatoes. The population is peculiar in its composition, more especially as compared with that of the more easterly parts of the peninsula. The great mass of the population are Hindus, but there are also Mohammedans, and a large number of Christians and Jews. The Jews are classified into white and black; and the Christians, divided between the Syrian and Romish churches, trace their origin partly to the Portuguese conquest, and partly to the missionary labors of St. Thomas the apostle.

COCHIN, once the capital of the principality above described, but now a seaport of the district of Malabar, in the presidency of Madras, stands in lat. 9° 58′ n., and long. 76° 18′ e., on the s. side of the principal channel, between the open ocean and the backwater mentioned in the preceding article. As this lagoon is, even in its lowest state, always navigable for canoes, its value, as a means of communicating with the interior, can hardly be overrated in a country where roads and bridges are nearly out of the question. C. is one of the chief cities on this coast with respect to shipbuilding and maritime commerce. Here the Portuguese erected their first fort in India in 1503. They were supplanted by the Dutch in 1663 — the epoch also of the transfer of Bombay to Charles II. In 1796 C. was captured by the British, and about ten years after, its fortifications and public buildings were destroyed, and its private dwellings very much damaged. Notwithstanding this check, the place continued to flourish; many merchant vessels have been built, besides ships of war for the local navy and frigates for the imperial service. The population of the city, numbering in 1891 about 17,600, is more heterogeneous than even that of the state of the same name, the additional elements being Dutch, Armenian, Arabian, and Persian. Its trade depends almost entirely on the produce of the cocoa-tree — viz., oil and cocoa fiber. Water is brought from a distance of 18 m. The average temperature is 78° Fahrenheit.

COCHIN CHINA, a name applied to the eastern part of the peninsula of Indo-China, and loosely identified with the former empire of Anam, which included three distinct regions, namely: Lower Cochin China, Upper Cochin China (or Anam proper), and Tonquin. For an account of the French possessions which are comprised within this region, see the articles, COCHIN CHINA, LOWER; TONQUIN, and ANAM. A mountain range of considerable height runs through the country parallel with the coast. The northern province of Tonquin is an extensive plain through which flows the river Songkoi. The largest river of this entire region is the Mekong or Cambodia, which rises in the mountains of China, flows through Laos and Cambodia, and after a course of some 1500 miles, separates into several branches, and finally discharges itself into the China Sea. Its total length is estimated at 2600 miles. Another noted river is the Hué, which flows through a fertile valley, and presents some of the finest scenery in Asia. In regard to climate, the changes of temperature and weather are very sudden. Much rain falls in C. C. during the whole summer, which produces a general inundation about the end of October. Sept., Oct., and Nov. are the best months of the year, and the most healthful for Europeans. The predominant race throughout the territory is the Anamite; but from a very early date there has been immigration of Chinese, from

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whom the Anamites themselves are regarded as an offshoot, but, despite their Chinese origin, they are, as a race, entirely distinct. They are nominally Buddhists, but practice a crude form of that religion, and are said to observe the worship of ancestors to a greater extent than is found among the lower orders of the Chinese. They are remarkable for the reverence they show for tombs. The selection of a place of burial is with them a very grave consideration, and the good or bad fortune of the family is supposed to depend upon it. The father is absolute in his own household; but the women in general are allowed liberty, and frequently engage in commerce and agriculture.

COCHIN CHINA, LOWER, or FRENCH, a colonial possession of France in the southern extremity of the eastern portion of the Indo-Chinese peninsula, extending from Cambodia and Anam on the n.n.e. to the China sea and the Gulf of Siam. It consists for the most part of alluvial plains intersected by the Mekong, Dongnai, Saïgon, and Vaco rivers, which are connected by numerous branch streams. This territory was acquired after a war provoked by the continuous persecutions for many years of the Christians in his dominions by the king of Anam, and especially by the murder of several French and Spanish missionaries. After an invasion, the three provinces of Saïgon, Bienhoa, and Mytho, together with the island of Pulo Condor, and a few others which lie off the coast, were taken possession of in 1861. In 1867, a new treaty, formed after the repression of formidable hostile aggressions on the part of some of the natives, led to the annexation of other three provinces — Vinh-Long, Chandor, and Haytien — thus completing the present colony of *Cochinchine française*.

Napoleon III., in urging on the vigorous war policy which led to this acquisition, had in view the tradition that France had earlier claims to be satisfied, and other wrongs to be redressed, than those which induced him and the Spanish government to resolve on putting an end to the oriental monarch's persecuting cruelty. In 1787, Ghialong, king of Anam, in want of assistance to secure his throne, entered into a treaty with Louis XIV., by which he engaged, in return for French aid, to cede the town and harbor of Touran (Kwang-han), with its territory and two adjacent islands. The little active assistance afforded by France was effective; Ghialong was established on the throne, and added Tonquin and Cambodia to his dominions. The promises made to France were not fulfilled, but her missionaries were protected. Of the three kings, however, who successively mounted the throne after the death of Ghialong, each excelled his predecessor in persecuting the Christians, whether European or natives, and in murdering the missionaries. Tuduk, who began to reign in 1847, issued an order the same year that all missionaries should be drowned; and another in 1851, that whoever concealed a missionary should be cut in two and thrown into the river. From the time of this latter decree, the blood of his victims never ceased to flow till the sanguinary struggles which led to the establishment of the colony of lower C. C. frightened the bloodthirsty religionist into toleration.

The climate, like that of the rest of Indo-China, is especially unhealthful during a portion of the year. The country is subject to monsoons, and the rainy season sets in in May or June. Toward the end of the rainy season, in October, storms are of frequent occurrence. The main occupation of the people is agriculture, and the chief crop is rice, which is exported chiefly to China, Java, and Europe. Other articles of export are cotton, hides, fish, pepper, and copra. Forests cover about 3500 sq. m., especially in the n.e., and contain valuable timber, both for shipbuilding and cabinet work. The minerals are of no great importance. The Anamites are the chief element in the population, which also includes Cambodians, Chinese, Malays, and Malabarians. The total population was estimated at 2,034,453 in 1897. The French numbered 4,335. The French have done much to promote civilization of the natives. Many schools have been built, and a considerable number of natives are employed as teachers. There has been a considerable advance in the construction of railways, telegraph lines, etc.; but the waterway still affords the chief means of communication, which is greatly facilitated by the presence of tide water in the delta of the Mekong. The principal towns are Saïgon, the capital; Rash-Gia, Shoton, Vinh-Long, Shodok and Hatien. For administrative purposes the country is divided into four provinces, namely: Saïgon, Mytho, Vinh-Long. and Bassac, and these into 21 arrondissements. The government is administered by a lieutenant-governor, resident at Saïgon, and a council composed equally of French and Anamite members. The provincial government, however, is under the general direction of the governor-general of Indo-China. The supervision of local matters is intrusted to the native officials.

COCHINEAL (*coccus cacti*), an insect used as a dye-stuff employed in dyeing scarlet and crimson, and in the preparation of carmine (q. v.) and lakes (q. v.).

C. consists simply of the bodies of the females of a species of *coccus* (q. v.), called *C. cacti*, because it feeds upon plants of the *cactus* family, particularly on one, therefore designated the C. plant, but known in Mexico as the NOPAL (*opuntia cochinillifera*), treated of in the article CACTEÆ. This plant is nearly allied to the prickly pear. It assumes a somewhat tree-like form. Its fruit, although eatable, is very inferior to that of the prickly pear. It is a native of Mexico and other warm parts of America, and is assiduously cultivated, in order to what may be called the cultivation of the valuable insect which it supports. The C. plant and insect have been introduced into Algeria; but no considerable success has yet attended the attempts to introduce them into the East Indies, although the East India company once offered a reward of £6,000 for their introduction. The introduction of C. into several other countries has been attempted from time to time with some success. About 1830 they were introduced into the Canary

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Islands, and after several years of cultivation they became one of the chief products of the islands, where in 1870 the crop had reached an annual value of over $3,000,000. Large quantities are produced in Java, and a peculiar variety is found in California. The latter are apparently the same as those raised in Mexico, but they produce a light pink dye, while those of Mexico and other countries give a deep scarlet color. Owing to the high price of C. various articles have been used in its adulteration. One of these is carbonate of lead, which when sprinkled upon the insects adheres to them, considerably increasing their weight. Other species of *opuntia* appear to be as suitable for the C. insect as *O. cochinillifera*, particularly *O. Hernandezii*, which is employed in Mexico, and *O. tuna*, which is chiefly used in Peru.

The C. insect is a small creature, a pound of C. being calculated to contain 70,000 in a dried state. The male is of a deep red color, and has white wings. The female, which is wingless, is of a deep brown color, covered with a white powder; flat beneath, convex above. When a plantation of the C. plant has been formed — by cuttings which are ready to receive the insect in eighteen months — the cultivator (*nopalero*) procures branches laden with C. insects; and keeping the branches, of which their succulency admits, till the mother-insects have laid their eggs, he places their bodies, with the eggs which they cover, in little nests formed of some cottony substance upon the C. plants, and the young insects, when hatched, soon spread over them. When killed and dried, they may be kept for any length of time without injury. The different appearances presented by C. as brought to market, are ascribed to the different modes of killing the insect. C. is one of the most important exports of Mexico. Cochineal insects are fed upon by birds, mice, and other insects, some of which suck out the bodies of the insect, leaving only the dry skin. The name cochineal is limited to that species of the hemipterous insects which were cultivated in Mexico previous to its conquest by Europeans. Other species of the same genus were known to the ancient Hebrews and Egyptians before the time of Moses, and were largely cultivated on a species of oak; in the Levant, Persia, Greece, Palestine, etc. Among the Arabs, by whom it has long been cultivated, this insect is known under the name of kermes, which signifies red dye. When the Spaniards found the insect reared on large plantations of cactus in Mexico, the natives prized it very highly, and in certain districts it formed one of the staple tributes to the crown. The Mexican species were soon introduced into Europe, where their superiority over those previously known was so marked, that the older species were soon entirely abandoned. Live insects were imported, and plantations of cactus were raised for their nourishment. The body of the *coccus cacti* is wrinkled transversely, having bristles on its posterior part, and an abdomen of a deep mulberry color. It has short, black legs and antennæ about one-third of the length of the body. Of the insects raised in Mexico, those which come from the vicinity of Oajaca are considered the best. These insects are fed on plantations of nopal (*opuntia cochinillifera*) and are attended with the greatest care. Branches of nopal covered with insects are cut off before the rainy season sets in and are carefully sheltered from the weather in a covered building. From these supplies the plantations are stocked at the close of the wet season, which usually takes place about the middle of October. When warmed by the sun the females soon begin to lay eggs, each female producing more than a thousand young, which soon spread themselves over the plants. The young females when impregnated attach themselves to the leaves of the plant and swell to such a size as to appear more like excrescences on the plant than actual insects. The males are very few in number, not more than one to 100 or 200 females, and are of no value as a dye. The first crop of females is picked off about the middle of December, and until May successive generations are gathered from time to time. The females full of young lose about two-thirds of their weight in drying. The process of gathering the insects is extremely tedious, and it is only possible for a laborer to pick off enough insects in a day to amount to about two ounces of cochineal. The killing is done in three ways: by placing on a hot iron; by placing in a hot oven, and by dipping in a basket into boiling water. Those killed on a hot iron turn black; when killed in the oven their color is gray, while those killed with hot water, which is considered the best method, turn to a brownish red color. This is the origin of the different grades of cochineal known in the market as "black grains," "silver grains," and "foxy," the latter being those killed in water. The coloring principle which causes cochineal to give its brilliant crimson color has been named cochiniline. It is very soluble in water and alcohol, but insoluble in ether. The cochineal is macerated in ether and the residue dissolved in alcohol. The fatty matter is removed by subsequent operations and the coloring matter is precipitated by different metallic salts. The crimson and scarlet dyes which are of the greatest value are formed by the use of chloride and nitrate of tin. There are a large number of methods in use to determine the amount of cochineal used in any particular dye. One method consists in decolorizing the dye made with a known weight of cochineal, by means of a solution of calcium hypochlorite. The amount of cochineal is, of course, directly proportional to the amount of chlorine employed in bleaching the solution. See illus., INSECTS, Vol. VIII.

COCHITUATE LAKE, in Middlesex co., Mass., 17 m. s. of Boston, covering a little more than 1 sq. m., whence Boston principally draws its supply of water.

COCHLĔA. See EAR.

COCHLĔARIA See SCURVY-GRASS.

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COCHRANE, JOHN DUNDAS, 1780–1825; an English sailor and traveler. In 1820 he laid before the admiralty a plan for exploring the river Niger, but it was rejected. In Feb., 1820, he started from London on a journey around the world, to be performed as far as possible on foot. After much suffering he made his way through Russia and Siberia to Petropaulowski, in Kamtchatka. There he married the daughter of a sexton, and abandoned the idea of crossing North America. Returning to London by the same route over which he had passed, he published a *Narrative of a Pedestrian Journey through Russian and Siberian Tartary from the Frontier of China to the Frozen Sea and Kamtchatka*. He died while making a tour in South America.

COCHRANE, THOMAS, Earl of Dundonald, a British naval commander, 1775–1860. He won recognition by his brilliant exploits in the Mediterranean, capturing on May 6th, 1801, a Spanish frigate of 600 tons and 319 men, though he himself had a much smaller and a poorly equipped vessel. In 1809 he attacked, with explosive ships, a French fleet in the Aix roads, and destroyed four of the enemy's vessels. Having entered parliament in 1806, he began to expose abuses in the administration of the navy, and thus made many enemies. In 1814 he was accused of complicity in an attempt to influence the stock market by spreading the rumor of Napoleon's death, and, though he always claimed that he was innocent, he was found guilty, imprisoned for a year, fined, and expelled from parliament. Nevertheless, his constituents remained his friends and returned him to parliament immediately afterward. Receiving an invitation to organize the Chilean navy, he went to Valparaiso in 1818. He there found the fleet in a wretched condition and consisting of a few vessels, most of which had been condemned: but with this poor material he managed to gain a series of remarkable successes over the powerful Spanish fleet. He took Valdivia in 1820 and carried San Martin's army to Peru, having in the meanwhile destroyed Spanish commerce on the Pacific coast, and performed one of the most brilliant exploits in naval history in cutting out the Spanish frigate, Esmeralda, from under the enemy's guns at the Castle of Callao. His quarrelsome disposition soon afterward involved him in difficulties with the Chilean government. He was accused of insubordination, resigned, and soon afterward was appointed admiral in the Brazilian navy. While holding that position he forced the Portuguese to evacuate Bahia, and reduced Maranhão; but he again laid himself open to the charge of insubordination, and resigned from the Brazilian service. His next venture was the command of the Greek navy in 1827 and 1828, but he accomplished nothing of importance. In 1832 he received a pardon for the offense of which he had been convicted in Great Britain, and was restored to the Order of the Bath and to his naval rank, becoming rear-admiral of the United Kingdom in 1854. He left an account of his naval career in *Narrative of Services in the Liberation of Chili, Peru and Brazil*, and *Reminiscences of a Seaman*.

COCK, properly, the name of the male of the common domestic fowl (see FOWL), but very generally extended to the males of other kinds of gallinaceous birds, and not unfrequently employed as an appellation of the males even of some kinds of small birds.

The ancients regarded the domestic C. as the companion of Mars, and in heraldry he is the emblem of strife, of haughtiness, of quarrels, and of victory. Guillim has the following quaint eulogium on the cock: "As some account the eagle the queen, and the swallow or wagtail the lady, so may I term this the knight among birds, being both of noble courage, and also prepared evermore to the battle, having his comb for a helmet, his sharp and crooked bill for a falchion to slash and wound his enemy; and as a complete soldier armed cap-à-pie, he has his legs armed with spurs, giving example to the valiant soldier to expel danger by fight, and not by flight. The cock croweth when he is victor, and giveth a testimony of his conquest. If he is vanquished, he shunneth the light and society of men!" The C. is said to have been the emblem of the ancient Gauls, who wore it on their helmets for a crest; and though the tradition does not rest on the authority of any medal or other monument, and is supposed to have been a mere play of words between gallus, a cock, and Gallus, a Gaul, the C. was placed, after the revolution, on the flags and ensigns of France.

As the emblem of watchfulness, the image of the C. was placed on the summits of church-steeples from a very early period. It is introduced by artists amongst the emblems of our Lord's passion, in allusion to St. Peter's sin, and for the same reason it is St. Peter's own emblem.

COCK DIVINATION, or ALECTROMANCY, is a method of divining in which a young white cock was made the principal actor. The plan pursued was to describe a circle, and divide it into as many equal parts as there are letters in the alphabet. Upon each of the spaces marked by its respective letter, a grain of corn was placed; and the letters from which the fowl picked the grains, when put together, formed the name of the person about whom inquiry was made.

COCKADE (Fr. *cocarde*, or *coquarde*). According to Wedgwood, the word signified originally a cocked-hat, or a hat with the broad flap looped up on one side, and was then applied to the knot of ribbon with which the loop was ornamented. Another view is, that it is derived from *coquart*, a beau, one fond of gay trappings. The word is now, however, restricted to signify an appendage to the head-dress worn as a military or naval distinction.

Badges of distinction were early had recourse to in party and civil warfare. A sprig of broom (*planta genista*) was the badge of the house of Plantagenet. In England, dur-

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ing the wars between the houses of York and Lancaster, the adherents of the former party were distinguished by a white and the latter by a red rose worn in the cap.

The party organized at the court of Charles IX. of France to perpetrate the massacre of St. Bartholomew, recognized one another by a paper cross. The faction of the *fronde*, opposed to cardinal Mazarin, wore stalks of corn for the same purpose; and certain military bands were called *lances vertes*, from decorating their lances with green twigs. The use of cockades, as marks of distinction in campaigns and battles, became very general about the beginning of the 18th century. Eugene and Marlborough gave the Germans, English, and Dutch, composing their army, a tuft of corn or grass as their signal or cockade. The use of the C. began to be more fixed in the war of succession. White being the color of France, and red of Spain, the two colors were united in the C. of the combined army. At last, in 1767, an authoritative regulation determined that every French soldier should wear a C. of white stuff; and in 1782, cockades were prohibited to all but soldiers. From this time till the revolution, the C. was an exclusively military badge; and, both in France and England, "to mount the C." was synonymous with becoming a soldier. But in the enthusiasm of 1789, the citizens of France generally assumed the tricolored ribbon as the badge of nationality and patriotism, which was soon also given to the army. The three colors were blue, white, and red: white had long been the color of France and its kings; the blue is understood to have come from the banner of St. Martin, and the red from the oriflamme (q.v.). Long before the revolution, the three colors were used in combination: they were given by Henry IV. to the Dutch, when they desired him to confer on them the national colors of his country, and have ever since been borne by the Dutch republic and kingdom of the Netherlands. At the restoration, the white C. of the monarchy again took its place, but had to give way once more to the tricolor, which continues to be the C. of the French army.

Black, with some distinction, enters into the cockades of the German nations. The Austrian is black and yellow; and the Prussian was black and white, abandoned for the black, yellow, and white of the German empire. After the German war of liberation in 1813, a national C. of black, red, and gold came into general use, and was afterwards assumed by the military and by officials. The wearing of these German cockades was prohibited in 1832, by a resolution of the German diet; but in 1848, they were again introduced, not only by patriots as a badge of German union, but into the armies. The national colors of Belgium are black, yellow, and red. Cockades of these colors were worn by almost the whole population of Brussels on occasion of the constitutional festival, July 21, 1860. Cockades of green, white, and red are worn in Italy.

The continental C. is generally in the shape of a flat disk, sometimes of metal, sometimes of silk or other stuff, with the colors disposed concentrically.

In England, the badge of the Stuarts was a white rose; and after the expulsion of the family, the white C. became the distinctive mark of the adherents of the exiled family, in opposition to the orange of Nassau and the black of Hanover; it is a favorite theme in Jacobite songs. The black C., to be seen on the hats of many gentlemen's servants, was unknown in Britain till the accession of the house of Hanover, and was then introduced by George I. from his German dominions. It seems to be understood that the right to use it belongs to naval and military officers, and the holders of some offices of dignity under the crown, including privy councilors, officers of state, supreme judges, etc. It is difficult to know where the line should be drawn, as the privilege is one of which the law takes no cognizance. It is often maintained that the distinction belongs to deputy-lieutenants.

COCKATOO', *Plyctolophus*, a genus of birds of the parrot family, or *psittacidæ*, distinguished from parrots by the greater height of the bill, and its being curved from the base, and by the lengthened, broad, and rounded tail. The head is also large, and in the true cockatoos is surmounted by a crest of long and pointed feathers, with their tips directed forwards, which can be erected and expanded like a fan or depressed at the pleasure of the bird. The true cockatoos are also all of generally whitish plumage, but often finely tinged with red, orange, and other colors, or mixed with these colors in more brilliant display. But the name C. is also commonly extended to nearly allied genera, as *calyptorhynchus* and *microglossus*, in both of which the plumage is generally dark, and to which belong the *black cockatoos* of Australia and of the Indian archipelago. The genus *microglossus*, to which belongs the great black C., or giant C. of New Guinea, is remarkable for the structure of the tongue, which is cylindrical, tubular, capable of being greatly protruded from the mouth, and terminates in a cloven horny tip. All the cockatoos are natives of the regions already named. They abound in Australia. They live not only on fruits and seeds, but partly on insect larvæ. Some of them are frequently to be seen in confinement in Europe, particularly the lesser sulphur-crested C. (*plyctolophus sulphureus*), which, although of comparatively tame plumage, is a general favorite on account of its docility. None of the cockatoos learn to speak many words. Their name is derived from their own proper cry. See illus., Birds, vol. II.

COCK'ATRICE, one of the fabulous monsters, a belief in the existence of which prevailed among the ancients and during the middle ages. It was sometimes distinguished from, and sometimes identified with, the basilisk. It was also regarded as possessing

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similar deadly powers. Its monstrous generation has already been noticed in the article BASILISK. For protection against it, travelers in Africa are said to have carried with them its relative, the cock, the crowing of which caused it instantly to expire. The word C. is sometimes used in the English version of the Old Testament. Perhaps all that can safely be affirmed of the meaning of the original Hebrew, is that it is the name of a venomous serpent. In heraldry, the C. is an imaginary monster, with the wings of a fowl and the tail of a serpent.

COCKAYNE. See COCKNEY.

COCKBURN, SIR ALEXANDER JAMES EDMUND, 1802–1880; son of Alexander Cockburn who was English minister in Colombia. He was educated at Cambridge, and called to the bar in 1829. In 1841, he was made a queen's counsel, and in 1847 was elected to parliament from Southampton, where he distinguished himself (1850) by defending Palmerston's foreign policy. He was soon afterwards appointed solicitor-general, and in 1851, promoted to attorney-general. In 1854, he was made recorder of Bristol; in 1856 appointed justice of the common pleas, and in 1859 he became lord chief justice of England. In 1871, he was made English arbitrator for the settlement of the Alabama claims. He differed with his colleagues at Geneva, refusing to sign the award.

COCKBURN, ALISON (Mrs.), 1712–94; author of one of the most delightful Scotch ballads, known as *The Flowers of the Forest.* She was the daughter of a border laird, and had little education, and was fond of rambling around the country. The song is generally believed to have been written after the departure for London of one John Aikman, an early lover. In 1731, she was married to Patrick Cockburn, of Ormiston, an advocate. She subsequently became acquainted with all the celebrities of the day. She was one of the belles of Edinburgh, a graceful dancer, an indefatigable letter-writer and composer of parodies, squibs, toasts, and character sketches. She was a relative of Walter Scott's mother.

COCKBURN, CATHERINE, 1679–1749; an English authoress, wife of Patrick Cockburn, a non-juring clergyman who finally conformed and received a living in Cumberland. She wrote several plays, among which may be mentioned *Agnes de Castro, Fatal Friendship, Love at a Loss,* and *Revolutions of Sweden.* She also wrote *A Defence of Locke's Essay on the Understanding.*

COCKBURN, Sir GEORGE, 1772–1853; an English naval officer whose operations against Martinique secured that island to Great Britain. He was active in the war with the United States in 1812–15, marauding along the shores of the Chesapeake and burning the public buildings at Washington. His last noteworthy sea employment was to convey Napoleon to St. Helena. He rose to the rank of admiral, was several times returned to the house of commons, and was one of the lords of the admiralty.

COCKBURN, GEORGE RALPH RICHARDSON, Canadian educator and member of parliament, b. in Edinburgh, Scotland, in 1834, and graduated at the Edinburgh University in 1857. He went to Canada in the following year, and in 1861 became principal of Upper Canada college, holding the office for 20 years. He became a member of the Canadian parliament in 1887 and was re-elected in 1891.

COCKBURN, HENRY THOMAS, Lord, a Scottish advocate and judge, was b. at Edinburgh in 1779. He was educated at the high school of Edinburgh and afterwards at Edinburgh university, where, though never distinguished as a student, he became the companion of men like Brougham, Horner, and Jeffrey, from whom he imbibed liberal opinions, greatly to the annoyance of the hereditary toryism of his family. He was called to the Scottish bar in 1800, and seven years later was appointed, by his relative, Lord Melville, one of the advocates whose duty it is to assist the lord advocate in the prosecution of criminal offenders, but was dismissed after holding office four years. Not till the introduction of jury trial in civil causes into Scotland in 1816, did C. find opportunity for remunerative professional employment. His powers were better adapted for success with a popular, than with a professional tribunal. Extremely simple, clear, and impressive, at times humorous, at times pathetic, always unaffected, and when he pleased eloquent, he urged his side of the question with so much earnestness and candor that the effect was almost irresistible. Under the Grey ministry of 1830, he was appointed solicitor-general for Scotland; and four years later he was made one of the judges of the Scottish supreme civil and criminal courts, and took, according to the Scottish custom, the title of lord Cockburn. He died 26th April, 1854, at his residence of Bonaly, in the neighborhood of Edinburgh.

The efforts of C. as an author were not numerous. He contributed to the *Edinburgh Review* a few articles, having, it would seem, chiefly a temporary interest. Those upon Scottish law reform are known to have had considerable influence in producing the changes desired. Late in life, he undertook, at the request of Jeffrey's executors, the *Life* of his beloved friend. This work was published in 1852. C. will be best remembered by the *Memorials of his Time,* which appeared posthumously in 1856. It is a kind of autobiography, into which have been interwoven numerous anecdotes illustrating old Scottish life, and numerous sketches of the men who composed the brilliant circle of Edinburgh society at the beginning of the present century. A portion of the MS. kept

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back until a date further removed from the times of which it treats, appeared in 1874, entitled *Journal of Henry Cockburn*.

COCK'CHAFER, *Melolontha vulgaris*, a beetle of the family *lamellicornes* (q.v.), and section *phyllophagi* (leaf-eaters), very common in England and most parts of Europe, comparatively rare in Scotland, famous for the ravages which it commits, both in the grub state and in that of a perfect insect—the winged beetle feeding on the leaves of fruit-trees, and of many forest-trees, as the sycamore, lime, beech, and willow; the grub devouring the roots of plants, particularly of pasture-grasses and corn. The C. is fully an inch in length, of a pitchy black color, with a whitish down, giving a sort of powdered appearance; the sides of the abdomen marked by a range of triangular spots; the abdomen terminating in a point; the antennæ short, terminating in a club formed of six or seven leaflets: the grub is about an inch and a half long, thick, whitish, with a red head and six legs. The C. does not live long after it has passed into its perfect state, but it lives nearly four years in the grub or larva state. The female C. deposits her eggs in the earth. The ravages of cockchafers were so great in some of the provinces of France in 1785, that the government offered a premium for the best mode of destroying them. The whole grass of a field has often been destroyed in a short time by their grubs, and the beetles themselves strip off the foliage of trees like locusts. They have sometimes appeared in prodigious numbers in some places in England: the river Severn is said to have been so filled with their bodies in 1574, that the water-wheels of the mills were clogged; and in 1688, they so abounded in the county of Galway, in Ireland, that they hung in clusters on the trees and hedges like bees swarming; the noise of their countless jaws at work was heard by every traveler, and was compared to that of the sawing of timber. In Scotland they are called *clocks*. See illus., BEETLES, ETC., vol. II. figs. 52–54.

COCKE, a co. in e. Tennessee, bordering on North Carolina, traversed by the Southern railroad, and watered by French Broad and Big Pigeon rivers; 458 sq. m.; pop. '90, 16,523, with colored. Surface mountainous and well wooded; productions, agricultural. Co. seat, Newport.

COCK'ER, a small kind of spaniel, very similar to the Blenheim dog, often black. The habits and disposition are similar to those of the spaniel. The small size of the C. fits it for ranging in low and thick coverts, and it is accordingly much employed by sportsmen in pheasant and woodcock shooting; but it must not be allowed to range to any considerable distance, as it cannot be trained to wait for the sportsman, but starts the game.

COCK'ER, EDWARD, widely celebrated on account of his *Arithmetic*, which has served as the model of almost all school-treatises subsequent to its publication, was born, it is supposed, in London about the year 1631 or 1632; and died between the years 1671 and 1675. The first edition of his famous *Arithmetic* (which was the first to confine itself to commercial questions only) was published, after his death, in 1677, by John Hawkins, who came into possession of C.'s MSS. C. was author of some other works, but his fame rests entirely on the one mentioned. The expression, "according to Cocker," became common through its frequent use on the title-pages of arithmetical treatises following his method.

COCKERELL, CHARLES ROBERT, 1788–1863; an English architect who visited Greece, Italy, and Asia Minor to study ancient architectural remains, making excavations at Ægina and other places, and enriching the British museum with many rare and valuable fragments. He became a member of the royal academy, and a professor of architecture, his lectures on which were highly esteemed. He was the designer of many public buildings in London, Cambridge, Liverpool, and other places, and was the author of several works on his favorite theme.

COCKERILL, JOHN, 1790–1840; an English engineer, who established at Seraing one of the largest machine-shops in Europe, half of it being owned by the king of Holland. He often had 2,000 men employed at one time. In 1839, he failed.

COCK'ERMOUTH, a town in the western part of Cumberland, England, at the confluence of the Cocker and Derwent, 25 m. s.w. of Carlisle. It is situated in an agricultural district, and in the vicinity are extensive coal mines. The ruins of a castle, founded toward the end of the 11th century, stand on a height on the left bank of the Cocker, near its junction with the Derwent. In 1387 it was captured by the Scotch, under Douglas, and in 1648 the castle was besieged for a month by the Royalists and afterwards reduced to ruins by the Parliamentarians. Near by is a tumulus, with a Roman camp and ditch, and many ancient relics have been found in the vicinity. The town was the birthplace of the poet Wordsworth. It has woolen and flax mills and manufactures hats, paper, hosiery, etc. Pop. in '91, 5464.

COCK-FIGHTING is said to have originated with the Athenians. In the earlier part of English history since the conquest, we find little mention of it; but it is evident that it existed in the days of Thomas-à-Becket, and until the time of the commonwealth it flourished, the pit at Whitehall having been erected and patronized by royalty. It was prohibited in 1654; and although there have been other acts passed with the view of putting it down, it still exists under prohibition.

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The greatest point considered in choosing cocks, is the breed. Formerly, there were established favorites, and very large sums were given for their chicks. Much art is said to be displayed in the training of cocks, and in trimming and preparing the cock for the combat; the fastening on of the spurs is a matter of considerable experience. Young cocks are called stags; two years is the best age. In fighting a match a certain number of cocks to be shown on either side is agreed upon, and the day before the match, the cocks are shown, weighed to the greatest nicety, and matched according to their weights. Their marks are all also carefully set down, to prevent trickery. The cocks within an ounce of each other in weight are said to "*fall in*" and are matched. Those which do not fall in, are matched to fight what are called "*byes.*" Those which do fall in, come into the *main.* The main is fought for a stake upon each battle, and so much for the main, or the winner of the most battles in the main; while the byes have nothing to do with the main, and are usually fought for smaller sums. Should the numbers be equal, so that the main cannot be decided, it is usual to separate two or more cocks which are matched to fight, and are of equal or a dead-weight, and to give or take an ounce either way with one of each of the birds which would fall into the byes, so as to make an uneven number.

A middling size is considered the best, and from 3 lbs. 6 oz. to 4 lbs. 8 oz. is the medium. Cocks sometimes fight in silver spurs, but more often in steel. The laws of fighting are very precise and particular.

To lend to brutes the means of destroying each other, and of rendering their conflicts more deadly than nature ever intended them to be, cannot be considered a spectacle calculated either to refine or to improve humanity; while the indulging in it as a sport, as it is practiced even in its lightest and least objectionable form, is simply cruelty. But the practices of placing a bird, that has perhaps been crippled in combat, down, without even his natural weapons, before a young stag armed, in order that the stag may be taught the art of killing, and the Welsh main, where the cocks fight until only one is left alive, are too disgustingly cruel to be thought of without indignation.

COCKIE-LEEKIE is in Scotland, a kind of soup made of a fowl boiled with leeks.

COCK LANE GHOST. In the year 1762, London was thrown into a state of extraordinary excitement by the reported existence of a ghost in the house of a Mr. Parsons, in Cock lane, Smithfield. Strange and unaccountable noises were heard in the house, and a luminous lady, bearing a strong resemblance to one who, under the name of Mrs. Kemt, had once resided in the house, but who had died two years before, was said to have been seen. Dark suspicions as to Mr. Kemt having poisoned the lady were immediately aroused, and were confirmed by the ghost, who, on being interrogated, answered, after the fashion of the spirits of our own day, by knocking. Crowds, including Dr. Johnson, were attracted to the house to hear the ghost, and the great majority became believers. At length a plan was formed by a few skeptics to ascertain the real origin of the noises. The girl from whom the sounds were supposed to proceed, was taken to another house by herself, and threatened with the imprisonment of her father in Newgate if she did not renew the rappings that evening, the noises having for some time been discontinued. She was observed to take a board with her into bed, and when the noises took place, no doubt was entertained that they had all along been produced by similar methods. A prosecution was then raised by Mr. Kemt, and Parsons was condemned to stand thrice on the pillory for imposture and defamation.

COCK'LE, *Agrostemma,* a genus of plants of the natural order *caryophyllæ,* in which the flower has ten stamens and five styles; the five teeth of the leathery naked calyx are much longer than the tube of the corolla, and the capsule is perfectly 1-celled. The common C., or corn C. (*A. githago*), is a frequent weed amongst crops of grain, a native of Europe or the w. of Asia, but now to be found in almost all parts of the world. It is an annual plant, clothed with very long hair; with large, solitary, terminal lilac flowers. The root, stem, leaves, and seed were formerly used in medicine; the seed is still sometimes sold in Germany under the name of black cumin (schwartz-kümmel). The corn C. is a very troublesome weed in some parts of Britain and the U. S.

COCKLE, *Cardium,* a genus of lamellibranchiate mollusks, having a shell of two equal ventricose valves, more or less of a heart-shaped appearance. The animal has two *adductor* muscles for drawing the valves closely together; its foot is remarkably large, and bent in the middle, and is capable of being suddenly straightened, so that the animal may move by a jump. More commonly, however, the foot is employed for excavating a hole in the sand or mud, in which the C. burrows; and when used for this purpose, it is distended by being filled with water. Cockles are usually gregarious, and vast numbers are found on sandy and muddy banks. The common C. (*C. edule*) is very abundant on the sandy parts of the British shores, and is one of the most valuable shell-fish, affording much palatable and nutritious human food. The number of known species is about 200; they are most numerous within the tropics, and particularly in the Indian ocean.—The genus *cardium* is made the type of a family *cardiadæ,* and of an order *carliaceæ,* which includes *veneridæ, mactridæ, tellinidæ,* and other families. See illus., Oolite Group, vol. X.

COCKNEY. This word is connected with *cocker* (Dutch, *kokeln,* to pamper; Fr. *coqueliner,* to dandle), which, according to Wedgwood, means primarily to rock the cradle.

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and hence to cherish, pamper. C. thus meant originally a child delicately nurtured, and was hence applied to the citizens of luxurious towns, as opposed to the hardier inhabitants of the country. The French *pays de cocagne*, and similar expressions among other nations, denote a utopia—an imaginary land of luxurious abundance without labor. London has been famed for its luxury from the earliest times—a veritable cocagne; and its inhabitants have now appropriated the name of cockneys.

COCKNEY SCHOOL OF POETRY, a nickname which J. G. Lockhart tried to fasten upon a school of writers, including Shelley, Keats, Hazlitt, and Leigh Hunt, whom he thought vulgar. The productions of these writers were said "to consist of the most incongruous ideas in the most uncouth language." See the *Quarterly Review*, April, 1818.

COCKPIT, in a ship of war, is a room near the after-hatchway, under the lower gun-deck; it adjoins the surgeon's cabin and the surgery. It contains the medicine-chests for the entire crew, and is the place where wounded men are attended to.

COCK OF THE PLAINS, *Tetrao* or *Centrocercus urophasianus*, the largest of the North American species of grouse. It is about one third smaller than the European capercailzie (q.v.), or cock of the woods. Its plumage is dense and soft, the prevalent color yellowish-brown, but beautifully mottled and varied with darker tints; the under parts white, with dark streaks and patches. On each side of the neck is a large bare space, capable, when the bird struts, of being inflated into a hemispherical sac. The female is smaller, and of less showy plumage than the male, and is destitute of the neck-sacs. This bird is an inhabitant of the desolate plains on the upper parts of the Columbia, and in the interior of California, living in flocks, and often feeding so much on species of *artemisia* that its flesh is almost too bitter to be eaten.

COCKRAN, a co. in n.w. Texas, formed 1876, unorganized and attached to Young co., for judicial purposes. Area, 840 sq.m.

COCKRAN, WILLIAM BOURKE, lawyer and politician, was born in Ireland, in 1854. He was educated in Ireland and in France, and shortly after his arrival in this country in 1871, was appointed teacher in a private academy, and subsequently, principal of a public school in Westchester co., New York. He studied law and was admitted to the bar in 1876. In 1882, he was appointed counsel to the sheriff of the city of New York, and reappointed in 1885. He was elected to Congress, in 1886 and 1891, and in the presidential campaign of 1896 spoke effectively for "sound money."

COCKRELL, FRANCIS MARION, lawyer and politician, b. Mo., 1834; elected from Mo. to U. S. senate, 1874, as a democrat, succeeding Carl Schurz; re-elected, 1881, 1887, 1893.

COCKROACH, *Blatta*, a genus of orthopterous (q.v.) insects, having an oval or orbicular flattened body, the head hidden beneath the large plate of the prothorax, long thread-like antennæ, and wings folded only longitudinally. The elytra are parchment-like, and the wings are sometimes very imperfectly developed, particularly in the females, as in the case of the common cockroach. The eggs of these insects are collected in a sort of a shell fixed to the abdomen of the mother, which at last she deposits in a suitable situation, attaching it by a glutinous secretion. The larvæ, when hatched, discharge a fluid which softens the cement that holds together the toothed edges of a longitudinal slit in this remarkable shell, and emerging through it, at once enter upon active life. They are very similar in form to the perfect insects, and, like them, very voracious. Cockroaches are most numerous in warm countries, and even the common C. (*B. orientalis*)—now so well known in America, a pest in many houses, particularly in towns, and, although not a coleopterous insect, often called the BLACK BEETLE—is said to have been imported from abroad, but its native country is uncertain. It is a nocturnal insect, concealing itself in holes during the day, and fleeing on the approach of a candle. It devours both animal and vegetable substances; and a dark-colored fluid, which it emits from its mouth, gives a disgusting smell to everything that it passes over.

COCKS'COMB, *Celosia cristata*, an annual plant of the natural order *amarantaceæ*, a native of the East Indies, one of the most familiar inmates of our hothouses and conservatories, often also planted out in warm borders, especially in the southern parts of Britain. It grows with an upright stem, which becomes flattened upwards, divides, expands, and forms a sort of wavy crest, covered with pointed bracts, and bearing on its surface many very small flowers.

COCK'S-FOOT GRASS, *Dactylis*, a genus of grasses, having the panicle of flowers much on one side of the stem, its secondary branches so short that the spikelets are much crowded into clusters; the glumes unequal, the larger one keeled; each spikelet containing 2 to 7 florets, each of which has two lanceolate scarcely awned paleæ. This genus is closely allied to fescue (*festuca*), but differs in habit. The common or rough cock's-foot grass (*D. glomerata*) is a native of Europe, Asia, North America, and the n. of Africa. It is very abundant in Britain, growing in tufts by waysides, in meadows, woods, etc., from the level of the sea to high altitudes on the mountains. It forms an important part of almost all the best natural pastures, is much relished by cattle, and grows with great rapidity after it has been cut, yielding a large quantity of herbage, and succeeding well on most kinds of soil, and in situations too shady for many other grasses. It is therefore generally sown along with other grasses. An improved variety,

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of greater size than the ordinary one, has been introduced into cultivation. In America, this grass is called ORCHARD GRASS, and is extensively cultivated. To this genus belongs also the TUSSAC GRASS.

COCK'S-SPUR THORN. See CRATÆGUS.

COCKSWAIN, or COXSWAIN (pronounced *cosn*), on board ship, is the steersman of a boat and commander of the boat's crew. He is expected to have his men always ready for service at short notice, and is furnished with a whistle to summon them.

COCLES, HORATIUS, "the one-eyed," one of the mythical heroes of ancient Rome, who, aided by Lartius and Herminius, defended the Sublician bridge against a great army under Lars Porsena, keeping the enemy at bay until the Romans behind them destroyed the bridge. When the bridge was about to fall, Cocles sent his two companies back; and when it had fallen, sheathing his sword and praying the river to favor him, he plunged in and swam safely to the shore. He was given as much land as he could draw a plow around in a day, and a statue in the comitium. No hero was held in higher honor, and Roman writers never wearied of telling what Macaulay repeats in his spirited *Lays of Ancient Rome*, "How well Horatius kept the bridge, in the brave days of old."

COCK OF THE WOODS. See CAPERCAILZIE.

CO'COA, CACA'O, or Co'co. The different kinds of C. either consist of, or are prepared from, the seeds of trees of the genus *theobröma*.

The genus *theobröma* (Gr. food of the gods) belongs to the natural order *byttneriaceæ*, and contains a number of species, trees of moderate size, with large undivided leaves and clustered flowers, all natives of the tropical parts of America. It is distinguished by a 5-leaved calyx; 5 petals, concave at the base, and extended into a strap at the apex; the stamens united at the base into a cup, which is divided upwards into 10 segments, 5 tips being without anthers, and the other 5, alternate with them, bearing 2 anthers each; a thread-like style, terminating in a 5-partite stigma; the fruit a 5-angled capsule, of a substance between leathery and woody, not splitting when ripe, 5-celled, and containing many seeds in a pap-like or butter-like pulp. The seeds of several species yield more or less of the C. of commerce. By far the most important species of this genus is *T. cacao*, to which the name cocoa-tree is often exclusively appropriated. It is extensively cultivated in tropical America and the West Indies, and its cultivation has been introduced into some parts of Asia and Africa. It generally rises with a bare stem to the height of only 6 or 7 ft., dividing into many branches, and attaining a height of only 16 or 20 ft. altogether, although it is sometimes twice that height. The fruit is somewhat like a cucumber in shape, and is 6 or 8 in. long, yellow, and red on the side next the sun; the rind is thick and warty, the pulp sweetish, and not unpleasant; the seeds numerous, compressed, and not unlike almonds, with a thin, pale, reddish-brown, fragile skin or shell, covering a dark-brown, oily, aromatic, bitter kernel, which consists mostly of the wrinkled cotyledons. These seeds are the *C. beans* of commerce; when bruised so as to be reduced to small pieces, after being shelled or decorticated, they become *C. nibs*. The cocoa-tree produces larger seeds in cultivation than in a wild state. The tree attains its full vigor and productiveness in seven or eight years, and generally yields two principal crops in the year. When gathered, the fruit is subjected to five days' fermentation in earthen vessels or in heaps on the ground, and then opened by the hand, and the seeds dried by the sun or by fire; or it is buried for a while in the earth, till the pulp becomes rotten. The latter method is said to produce the best cocoa (*earthed C.*, or *cacao terré*). See illus., TEA, ETC., vol. XIV.

C. is very nutritious. The principal constituent of C. beans is the soft, solid oil called *C. butter*, which forms more than 50 per cent of the whole shelled bean, about 22 per cent being starch, gum, mucilage, etc., and 17 per cent being gluten and albumen. They contain also a crystallizable principle called *theobromine*, analogous to caffeine (q.v.), but more nitrogenous.

For dietetic use, C. is prepared in several ways. It is made into chocolate (q.v.); it is crushed into *C. nibs*, the purest state in which C. can be purchased in shops; or the unshelled bean is powdered in a hot mortar, or between hot rollers, which yields a paste capable of being mixed with sugar, honey, starch, etc., sold in shops under the name of soluble C., rock C., and common cocoa.

C. is eaten in the solid state in the form of cakes and bonbons, or is scraped down, and treated with boiling water or milk. When C. nibs are infused with water like coffee, they yield a highly palatable beverage, which is much lighter than any other infusion of cocoa. The large quantity of oily matter present in the bean tends to make the various infusions thick and heavy, so that they do not agree with some delicate stomachs. The annual consumption of C. is upwards of 100 millions of pounds.

An infusion of the broken and roasted shells of cocoa-beans is sometimes used in the same way as tea or coffee. The pulp of the fruit is eaten in the countries in which the tree grows, and a kind of spirit is obtained from it by fermentation and distillation.

CO'COA-NUT, or Co'co-NUT, the well-known fruit of a species of palm, *cocos nucifera*, perhaps originally a native only of the Indian coasts and South Sea islands, but now diffused over all tropical regions. The cocoa-nut palm belongs to a genus having pinnate leaves, and male and female flowers on the same tree, the female flowers at the base of

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each spadix. The genus is further distinguished by a simple 3-celled ovary, which is succeeded by a coarse, fibrous, 1-celled drupe, two of the cells becoming abortive. There are about 18 known species, all natives of South America, except the most important, the cocoa-nut palm itself. The American species prefer dry and somewhat elevated districts. The cocoa-nut palm, on the contrary, is seldom found at any considerable distance from the sea-coast, except where it has been introduced by man, and generally succeeds best in sandy soils near the sea. It is always one of the first of the larger plants to establish itself in the low islands of the Pacific ocean, so soon as there is soil enough. It has a cylindrical stem, about 2 ft. in diameter, and from 60 to 100 ft. high, with many rings marking the places of former leaves, and bearing at its summit a crown of from 16 to 20 leaves, which generally curve downwards, and are from 12 to 20 ft. in length. The flowers proceed from within a large pointed spathe; the fruit grows in short racemes, which bear, in favorable situations, from 5 to 15 nuts; and 10 or 12 of these racemes, in different stages, may be seen at once on a tree, about 80 or 100 nuts being its ordinary annual produce. The tree bears fruit in from 7 to 8 years from the time of planting, and continues productive for 70 or 80 years. Of the three round black scars at one end of the shell, the one which alone can be easily pierced with a pin, and through which an opening is commonly made to get out the *milk*, is the destined outlet of the germinating embryo, which is situated there, the kernel consisting generally of the albumen (q.v.) destined for its nourishment. The thick husk is remarkably adapted to the preservation of the seed, whilst the nut is tossed about by the waves, until it reaches some shore far distant from that on which it grew.

The Cocoa-nut affords to the inhabitants of many tropical coasts and islands great part of their food; it is not only eaten as it comes from the tree, both ripe and unripe, being filled in a young state with a pleasant milky fluid, but is also prepared in a variety of ways, as in curries, etc.

The kernel of the cocoa-nut contains more than 70 per cent of a fixed oil, called COCOA-NUT OIL, or COCOA-NUT BUTTER. The oil is itself an important article of commerce, being much employed in Europe, particularly for the manufacture of *stearine candles;* and also of a *marine soap*, which forms a lather with sea-water. In tropical countries, and particularly in the east, it is much used as a lamp oil, and as an unguent. It is also employed as an article of food, so long as it remains free from rancidity, to which, however, it is very liable. It is obtained by pressure of the bruised kernel, or by boiling over a slow fire, and skimming off the oil as it floats on the surface. A quart, it is said, may be obtained from seven or eight cocoa-nuts. It is liquid in the ordinary temperatures of tropical countries, but in colder climates becomes a white, solid, butter-like oil. It becomes liquid about 74° F. It can be separated by compression in the cold into a more liquid portion called *olein*, and a more solid part termed *cocostearin*, or *cocosin*, which is of complex constitution, and contains at least six fatty acids. Cocoa-nut oil is not a good lamp oil, as it chars on the wick, and burns with smoky flame. This remark applies also to the *olein* obtained from it, which, however, is used mixed with sperm oil, but it lowers the value of the sperm oil. Cocoa-nut oil and resin melted together yield a substance capable of being used with success in filling up the seams of boats and ships, and in tropical countries, for covering the corks of bottles, as a protection from the depredations of the white ants.

The root of the cocoa-nut palm possesses narcotic properties, and is sometimes chewed instead of the areca-nut.—When the stem is young, its central part is sweet and eatable; but when old, this is a mass of hard fiber.—The terminal bud (*palm cabbage*) is esteemed a delicacy, and trees are often cut down for the sake of it.—The saccharine sap (*toddy*) of the Cocoa-nut, as of some other palms, is an esteemed beverage in tropical countries, either in the state in which it is obtained from the tree, or after fermentation, which takes place in a few hours; and from the fermented sap (*palm wine*), a spirituous liquor (*arrack*) is obtained by distillation. The juice is often also in the East Indies boiled down to yield sugar (*jaggery*).

The dried leaves of the cocoa-nut palm are much used for thatch, and for many other purposes, as the making of mats, screens, baskets, etc., by plaiting the leaflets. The midribs of the leaves supply the natives of tropical coasts with oars.—The wood of the lower part of the stem is very hard, takes a beautiful polish, is employed for a great variety of purposes, and is imported into Britain for ornamental joinery, under the name of PORCUPINE WOOD.—The fibrous center of old stems is made into cordage.—By far the most important fibrous product of the cocoa-nut-tree is Coir (q v.), the fiber of the husk of the imperfectly ripened nut. The husk of the ripe nut is used for fuel, and also, when cut across, for polishing furniture, scrubbing floors, etc.

The shell of the cocoa-nut is made into cups, goblets, ladles, etc., and is often finely polished and elaborately ornamented by carving.—Within the nut there is occasionally found a small stony substance, of a bluish-white color, "a sort of vegetable bezoar," called in India *calappa*, which is eagerly purchased by the Chinese, who ascribe great virtues to it as a sort of amulet to preserve them from diseases.

Cocos butyracea, one of the South American species of this genus, is a very large tree, and its nut abounds in an oil and butter of similar quality to that obtained from

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the cocoa-nut.—The DOUBLE COCOA-NUT of the Seychelles islands is the fruit of a palm of a different genus. See illus., PALMS, ETC., Vol. XI.

COCOA-NUT BEETLE, *Batocera rubus*, a large beetle of the family *longicornes* (q.v.), tribe *lamiariæ*, the larvæ of which are very destructive in cocoa-nut plantations, eating their way in all directions in the stems of the younger trees. They are destitute of feet, large and pulpy, and of repulsive aspect; but are esteemed a luxury by the coolies of the east. They resemble the *grugru worms* of South America.

COCOA-PLUM, an edible fruit growing on a shrub of the order *rosaceæ*, in the West Indies, and some of the s.w. United States. It is yellow, purple, or black, and is much like a large plum in appearance.

COCO-MARICOPAS, or MARICOPAS, a tribe of Indians living in Arizona, on the Gila river, and occupying the same territory with the Pimas, who are advanced in civilization to a like extent. The joint reservation is about 25 m. long and 4 m. wide. Both tribes are cultivators of the soil, and raise large crops. They live in villages of 20 to 50 houses, usually surrounded by gardens and cultivated fields. Their houses are built of corn husks and straw, and are supported by stakes. Attached to each house is an open booth or wigwam where they pass their time in fair weather. Each family has also a granary or storehouse; and they have horned cattle, horses, and mules. Their food is chiefly bread, made of flour and corn meal, and vegetables. They raise cotton, and make good cloth therefrom. Their basket work and pottery also are good. The women wear simply a long strip of cotton cloth wound around the loins, and sandals made of raw hide on the feet. Their heads are bare, and the hair is left to hang freely down the back. Except for a breech cloth the men go naked, but in cool weather use blankets. The hair is never cut except over the eyes, and there it is "banged," as the style is called in these days. They believe in a great spirit, and in an existence after death, and avoid polygamy. They say that their souls will go to the banks of the Colorado, the dwelling place of their ancestors, and there be changed into various animals or birds, and also that feuds with other tribes will continue in the future existence. Their language is allied to that of the Yumas of Colorado. There is little doubt that they are descended from the strange people who left such remarkable cities and fortifications in that part of America. At the last census they numbered only 815 persons.

COCOON, a silken envelope which the larvæ of many insects spin for themselves immediately before their transformation into the pupa state, and which serves for the protection of the inactive and helpless pupa. The name is sometimes extended to coverings formed of other materials, by agglutination or otherwise. Many insects mix foreign materials of various kinds with their silken cocoons; some caterpillars, as those popularly called *woolly bears*, working into them the hairs with which their own bodies were previously covered; and others fastening together the sides of a leaf or of several adjacent leaves. Some of the moths, which attach their silk to leaves, so that the leaf itself forms part of the protective covering of the pupa, proceed with a mathematical nicety as to the position and direction of their threads, more wonderful, if possible, than even that exhibited by bees in the building of their comb. The silken substance of which cocoons are made, is produced much more abundantly by some kinds of larvæ than by others; the cocoons of some being only an open net-work, whilst others form a compact ball. The C. of the common silk-worm exhibits externally a loose gauze-like covering, within which is a close and compact oval ball; yet all is of one continuous thread, which may be unwound from it 1000 ft. long. Different parts of this thread are of different qualities, but the stronger part of it may be unwound as easily as a ball of cotton. The insect works from the outside inwards, and the outer parts of the C. are produced first. The spinnerets by which the C. of the silk-worm and those of other moths are produced, are situated at the mouth of the caterpillar; but the larvæ of a few insects—not lepidopterous—have them at the opposite extremity of the body.

COCOTTE (French), a fast girl or woman, a "pretty horse breaker," a trollop. Synonymes are *gadoue*, *demi-mondaine*, etc.

CO'CUM OIL, a solid oil or vegetable butter, obtained from the seeds of *garcinia purpurea*, an Indian tree of the same genus with the mangosteen. It is white or pale greenish-yellow, brittle or friable, with a faint and not unpleasant odor. It melts at 95° F., but when cooled after being melted, remains liquid to 75° F. It is used for mixing with ghee (butter), and is exported to Britain for mixing with bear's grease in the manufacture of pomatum.

COCY'TUS, the name given by the ancients to a river of Epirus, fed by the snows of Pindus, and which, after a long underground course, was regarded as falling into the Acherusian lake.—Cocytus was also the name of a river of the infernal regions, a branch of the Styx.

COD, *Gadus morrhua*, or *Morrhua vulgaris*, a fish of the family *gadidæ*, which almost rivals the herring in its importance to mankind. The genus to which it belongs is distinguished by having three dorsal fins, two anal fins, and a barbule beneath the chin. The C. sometimes attains a weight of 100 lbs.; but even from a small size, it is in request for the market and the table. The roe of the female has been esti-

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mated to contain from four to nine millions of eggs, a reproductive power which seems beneficently intended to provide supply for far more extensive fisheries than are yet carried on. The C. is found in all the northern parts of the Atlantic ocean, and in the arctic seas; it is not known in the Mediterranean. It occurs both on rocky coasts and on sandbanks, where the largest are usually caught in depths of from 25 to 50 fathoms. The productiveness of the great banks of Newfoundland excels that of all others, but the cod-fisheries near the coasts of Sweden, Iceland, and the n. of Scotland, are also important. The Dutch were engaged in the cod-fishery as early as the middle of the 14th c., and the English resorted for this purpose to the coasts of Iceland about the same period. The French have also engaged largely in the cod-fishery. More than 6,000 European vessels are said to be employed in it, besides boats along the shores. The fishery is always carried on by means of lines and hooks, partly by *long-lines* and partly by *hand-lines*. One man has been known to catch from 400 to 550 fish, on the banks of Newfoundland, in 10 or 11 hours; and 8 men to take eighty-score in a day on the Dogger bank. The C. is very voracious. Small fishes, shell-fish, etc., are used for bait. The C. is used as food, either fresh, salted, or dried. Great quantities of dried C. are carried from Newfoundland to the West Indies, and are consumed also in the Roman Catholic countries of the s. of Europe. *Cod sounds* are esteemed a delicacy, and are often salted, and so sent to market. They are also used in a dried state as isinglass. The recent discovery of the medicinal value of cod-liver oil (q.v.) has added to the economical importance of this fish.

ROCK C. and RED C. are names given to the common C. when its color is somewhat affected by living among weedy rocks.—BALTIC C. is a name of the dorse (q.v.).

CODA, in music, is the ending or winding-up of a composition by an extra-melodic phrase, for more completely establishing the final cadence. It may be compared to the peroration of an oratorical discourse.

CODDINGTON, WILLIAM, 1601–78; a native of Lincolnshire, Eng., and founder of the colony of Rhode Island. He came out in 1630 with a commission as magistrate, landing at Salem, and was for some time a trader in Boston. He undertook the defense of Ann Hutchinson, and opposed similar persecution in other cases, but without success. April 26, 1638, he, with eighteen others, removed to the island of Aquidneck and founded a colony, which was to be judged and guided by the laws of Christ. He was elected judge and governor in 1640, and held the office until the colony was incorporated in the charter with Providence plantations. In 1651, he went to England, where he was granted a commission as governor of Aquidneck island, independent of the remainder of the colony, but he never undertook to exercise the authority, and soon resigned. In 1674, he was once more made governor.

CODE (Lat. *codex* and *caudex*), the primary meaning of the Latin word was the trunk or stem of a tree; latterly, it came to signify more especially wooden tablets bound together, and covered with a coating of wax, which were used for writing on. After parchment and paper were substituted for wood, the name C. was still retained. Cicero applies it to a bill; but it was not till still later, in the times of the emperors, that it was used to express a collection of laws and constitutions.

Codes, Roman.—1. *Codex Gregorianus and Hermogenianus.*—The term *codex* never was applied to the laws of the twelve tables, and the earliest collections so called were those of Gregorianus or Gregorius, and Hermogenianus. Of these, whether two separate collections, or two parts of one collection—a disputed point—we have only fragments. They never received the imperial authority, but they were quoted as authoritative compilations in the courts, and they supplied the models on which the subsequent works of Theodosius and Justinian were executed.

2. *Codex Theodosianus.*—This compilation was executed by a commission of eight persons, appointed by Theodosius the younger in the year 429, and afterwards increased to sixteen. The work was completed and published, or rather promulgated, as law throughout the eastern empire in 438, and declared to be a substitute for all the constitutions made since the time of Constantine. In the western empire also, having been laid before the senate, it was confirmed as law in the same year by Valentinian III., the son-in-law of Theodosius. Nine years later, the new constitutions (*novellæ constitutiones*), which had been made since the promulgation of the C., were likewise promulgated in the western empire. The name of novels (*novellæ*) continued to be given to all the constitutions issued subsequent to the date of the Theodosian C. up to the overthrow of the western empire. The C. of Theodosius has been, in a great measure, preserved. It consists of sixteen books, which are subdivided into titles and sections. The best edition is that of J. Gothofredus (6 vols. fol., Lugd. 1665), which was re-edited by Ritter (Leip. 1736–45). This edition contains the Theodosian C. entire, except in the first five, and part of the sixth book, for the reproduction of which the breviary or abridgment prepared by the orders of Alaric II., king of the Visigoths—which itself may be regarded as another C.—formed the only guide. Some recent discoveries of MS. and palimpsests have added considerably, not only to our critical knowledge of the contents of this C., but have enabled us to restore several of the genuine constitutions of the first five books. Of the 262 laws and fragments of laws, which were omitted in the breviary, 62 have been thus restored (see *Jus Civile Antejustin.*, Berol. 1815).

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3. *Codex Justinianeus.*—In 528, the emperor Justinian appointed a commission of ten persons, one of whom was the celebrated Tribonian (q.v.), to compile a C., incorporating in it the previons codes of Gregorianus, Hermogenianus, and Theodosius. and also the constitutions (q.v.), rescripts (q.v.), and edicts (q.v.), subsequently issued. The work was performed in fourteen months, and it was then declared that the new C. should supersede the older compilations. A second edition of this work, revised, and having subsequent constitutions, etc., incorporated (*Codex Repititæ Prælectionis*), is what we now know as the C. of Justinian. It consists of twelve books, divided into titles.

Gothic C.—The laws of the barbarians were all collected into a single C., which bore the title of *Codex Legum Barbarorum.* Of these various systems, the first was that of Alaric, king of the Visigoths, mentioned above, augmented by the legislative labors of his successors. To this C. was given the title of the Gothic law, *par excellence,* and it was the best and fullest of all the barbarian codes. The second C. comprised in the collection was that of the Burgundians; the third, the Salic law (q.v.), composed when the Franks issued from their German forests; the fourth, the law of the Frisians, which dates from the times of their conquerors, Pepin and Charles Martel. These, and all the other codes by which the tribes of the n. which overthrew the empire were governed, merged at last in the feudal system, and a mass of local customs speedily arose which introduced the greatest uncertainty into jurisprudence.

French Codes.—Charles VII. was the first of the kings of France who attempted, by a series of general *ordonnances,* to introduce something like uniformity into the legislation of France; and several of his successors, in particular Louis XI. and Henry III., entertained the idea of establishing a single C. for the whole kingdom. A C., having this object in view, was subsequently prepared by Michel de Marillac, and published in 1629. It consisted of 471 articles, and is spoken of by French jurisconsults in terms of the highest praise. Its reception, however, was very partial, confined indeed to the jurisdiction of the parliament of Dijon. Louis XIV., who, amongst his other ambitions, affected that of becoming the French Justinian, published a series of very important ordonnances, embracing most of the leading departments of the law. The work was executed by a commission composed of the most distinguished magistrates and advocates of the kingdom, and before the various ordonnances received the royal assent, the king caused them to be discussed with the principal officers of parliament. Minutes of these discussions have been preserved, and they constitute one of the most precious monuments of the history of French jurisprudence. Many important chapters were subsequently added to this C., before it assumed the form in which, as the C. of Louis XV., it represents the condition of French jurisprudence previous to the revolution.

Such, with the addition of sundry attempts at legislation during the period of anarchy which succeeded, was the position of affairs when Napoleon assembled that brilliant band of jurisconsults—Tronchet, Portalis, Merlin, Bigot-Préameneu, Treilhard, Pensey, etc.—by whose labors, aided in no insignificant degree by that marvelous insight into human affairs which he himself possessed, the modern legislation of France, and of no small portion of the rest of Europe, was called into existence. Such was the energy which he contrived to bring to bear on the work, that the vast edifice of the C. Napoleon, or C. Civil, was reared in a single year, the first title having been promulgated on 5th Mar., 1803, and the last on 30th Mar., 1804. The C. de Procédure Civile followed in 1806, the C. de Commerce in 1807, the C. d'Instruction Criminelle in 1808, and two years afterwards, the C. Pénal. The period of the restoration produced several codes of less importance—forest-laws, fishing-laws, etc. The C. Napoleon received the force of law in the countries which were successively subjugated by France; in Italy, in the kingdom of Holland, in the Hanseatic departments, in the grand duchy of Berg. In the Rhenish provinces and in Belgium, it still forms the basis of legislation. Several other countries have since codified their legislation, in most cases adopting modifications of the C. Napoleon.

The term code is defined in the United States as a body of laws established by the legislative authority of the state, and designed to regulate completely, so far as a statute may, the subjects to which it relates. The revision of 1873, taking effect in 1874, was declared by Congress to be the law of the land—all pre-existing laws being thus repealed. Certain errors in this revision were corrected by subsequent enactment, and were incorporated in it. In 1878, Congress enacted that the edition of '78 should be taken as legal evidence of the laws therein contained in all courts of the nation, and of all states and territories, though "not to control in case of any discrepancy the effect of any original act as passed by Congress since Dec., 1873." The earliest and most complete code of the states is that of Louisiana, by Edward Livingston, in 1824. It is based on the code Napoleonne, and has 3522 articles in one series, but comprises three books. The first New York code was the Code of Civil Procedure, taking effect in 1848. A Code of Procedure went into effect in Missouri in 1849; California and Kentucky, 1851; Ohio, 1853; Iowa, 1855; Wisconsin, 1856; Kansas, 1859; Nevada, 1861; Dakota and Oregon, 1862; Idaho and Montana, 1864; Arizona, Minnesota, and Nebraska, 1866; Arkansas and North Carolina, 1868; Washington and Wyoming, 1869; South Carolina and Utah, 1870; Connecticut, 1879; Indiana, 1881. A Code of Criminal Procedure was adopted in California in 1850; Kentucky, 1854; Iowa, 1858; Kansas, 1859; Nevada, 1861; Dakota, 1862; Idaho, Montana, and Oregon, 1864; Washington and Wyoming,

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1889; Arkansas, 1874; Utah, 1876; Arizona, 1877; Wisconsin, 1878; Nebraska, New York, and Indiana, 1881; and Minnesota, 1883.

CODE'IA, an alkaloid existing in opium with meconic acid; formula, $C_{18}H_{21}ONO_3$. It is insoluble in alkaline solutions, but soluble in ether, alcohol, or water.

CODEX, originally the Roman name for the trunk of a tree, and also applied to the smooth tablets smeared with wax on which the Romans wrote their records. It finally came to mean any written document, but especially designating collections of laws. Modern scholars give the title to versions of the Scriptures, and sometimes to important secular manuscripts (see CODE, for some of these codices; and also under their several names, such as ALEXANDRIAN CODEX, etc.).

CODEX ALEXANDRINUS. See ALEXANDRIAN CODEX.

CODEX BEZÆ, or CODEX CANTABRIGIENSIS, a manuscript believed to have been written in the 6th c., containing the four gospels and the Acts in Greek and Latin on opposite pages. It was found in a monastery at Lyons, France, and presented to Cambridge university in 1581 by Theodore Beza.

CODEX EPHRAE'MI, a palimpsest manuscript of portions of the Greek Bible preserved in the national library in Paris. It is judged to be as old as the 5th c., and in critical authority it ranks next to the Sinaitic, Vatican, and Alexandrian manuscripts.

CODEX SINAITICUS. See SINAITIC CODEX.

CODEX VATICANUS. See VATICAN CODEX.

COD'ICIL, a supplement to a will, whereby anything omitted is added, or any change demanded by the altered circumstances of the testator or the beneficiaries, is effected. A C. is authenticated in the same manner as a will, and possesses the same privileges when holograph, or written by the hand of the testator himself. See WILL.

CODIFICA'TION, the act of forming a code (q.v.), or systematic collection of laws. Though a code, in the wider sense, comprehends frequently the whole legislation of a country, there is a narrower sense in which the term is applied to a particular branch of legislation, such as commercial law, criminal law, marine, etc. See CODE.

CODINGTON, a co. in e. S. Dakota, formed 1877; pop. 1890, 7037.

COD-LIVER OIL is generally obtained from the livers of the common cod (q.v.), but likewise from allied species, as ling, dorse, coal-fish, torsk, etc. In these fish, the adipose tissue (q.v.) containing oil, is almost entirely confined to the liver, in which they agree with the shark tribe, whilst in other fish, as in the herring and salmon, the oil is diffused over the entire structure of the animal. Cod-liver oil is prepared largely in Britain, Norway, and Newfoundland. There are three varieties of the oil sold in commerce—*pale cod-liver oil*, *pale-brown cod-liver oil*, and *dark-brown cod-liver oil*.

In the preparation of the oil, the livers are placed in a tub with a layer of spruce boughs at the bottom, and subjected to pressure, when the light-colored or pale oil exudes, and is run off by an opening at the lower part of the tub. As the livers partially putrefy, more oil escapes, which is darker than that procured from the fresh livers, and constitutes the pale-brown oil; whilst the residual livers being boiled with water, part with the remaining oil they contain, and yield the dark-brown oil. The pale oil thus approaches more nearly the condition in which the oil is present in the livers, while the other varieties are more or less impregnated with the products of the putrefaction of the livers. The purer oil has a peculiar fishy odor and taste, which is not disagreeable, although it remains for a little time, and in some cases requires a little practice to get accustomed to it. The darker varieties have more or less of a disagreeable empyreumatic odor and taste, and leave in the throat an unpleasant nauseous sensation, more difficult to overcome.

The oil mainly consists of oleic and margaric acids, in combination with glycerine, and holding in solution the constituents of the bile, acetic acid, a phosphorized oil, as also iodine and bromine. These ingredients are most largely present in the light-colored oil. Cod-liver oil is occasionally adulterated with more or less train-oil, to which a little iodine has been added. In the purer varieties of cod-liver oil, the presence of any such admixture can be at once observed from the disgusting odor, although in the darker varieties of cod-liver oil the test of odor cannot be relied on.

As a remedy, cod-liver oil has a great reputation as efficacious in the treatment of scrofulous and tubercular diseases, and especially in consumption (q.v.); it has also been used extensively in chronic rheumatism, in rickety affections, and in other diseases of the bones and joints. The virtues of cod-liver oil have been ascribed to iodine, bromine, and other specific ingredients; but, on the whole, the most probable view of its action is that it is simply a fattening agent—a fatty food—and that it acts by nourishing the system in cases attended with emaciation, just as new milk, cream, and butter, or fat bacon, will sometimes act in similar cases. Cod-liver oil is often found to be more easily digested than, from its somewhat disagreeable odor and taste, might have been expected. Children, in particular, often take it readily; and in emaciated old people, it is sometimes of great service in conjunction with remedies suited to the peculiar character of the case. In true tubercular consumption, it has for some years enjoyed a great reputation; but it is very far from having anything like a specific remedial action in that disease. Cod-liver oil is commonly taken in doses of from a desert-spoonful to a table-spoonful three times a day.

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COD'RINGTON, Sir EDWARD, G.C.B., etc., a distinguished British admiral, third son of Edward Codrington, esq., was b. in 1770, and entered the navy in 1783. In 1794, he was lieut. of the *Queen Charlotte*, lord Howe's flag-ship, in the actions of the 28th and 29th May and 1st June. At the battle of Trafalgar, in 1805, he was capt. of the *Orion*, 74. He afterwards served in the Mediterranean, and in North America, and rose to the rank of vice-admiral in 1821. On Nov. 1, 1826, he was appointed commander-in-chief of the Mediterranean squadron, and in that capacity took the leading part in the battle of Navarino (q.v.). In reward for this victory he received the grand cross of the bath, with Russian and French orders; but the battle being considered an "untoward event," was appointed commander-in-chief at Portsmouth. He died April 28, 1851.

CO'DRUS, the last king of Athens, was the son of Melanthus, and, according to Grecian legend, sacrificed his life for his country about the year 1068 B.C. A war raging between the Athenians and Dorians, the oracle declared that the victory should belong to those whose king was slain by the enemy; whereupon C., attiring himself as a peasant, entered the Dorian camp, and having picked a quarrel with some of the soldiers, contrived to have himself slain. His son, Medon, was made archon (q.v.) for life, on the pretense that no one was worthy to succeed such a man as king. The accounts, however, which have come down to us, indicate that the sons of C. had quarreled about the succession after their father's death, and it is more probable that the aristocratic families (the Eupatrids) took advantage of the opportunity presented to them, of diminishing the regal authority by abolishing the name. A temple dedicated to C. was discovered at Athens in 1886.

CODY, WILLIAM FREDERICK (Buffalo Bill), was born in Scott co., Iowa, Feb. 26, 1845; he became one of the riders of the Pony express at its establishment in 1860. At the beginning of the Civil War he was government scout and guide; in 1868 he enlisted in the 7th Kansas Cavalry; in 1867 he contracted with the Kansas Pacific Railroad to furnish buffalo meat to its laborers building the line, and so earned the name "Buffalo Bill;" he was again appointed government scout in 1868; in 1872 he was elected member of the Nebraska legislature. He served in the 5th Cavalry in the Sioux War of 1876, and in the battle of Indian Creek, killed Chief Yellow Hand. In 1883 was organized his Wild West Show, a representation of actual life on the plains, and in 1887 he took the Show to Europe.

CO-EDUCATION (Lat., *con-educare*). The association of the sexes in the same classes for instruction is a subject that has been widely discussed for a half century, especially in the United States, where the experiment was first tried, and where the most favorable results have been obtained. Giving a brief summary of arguments on both sides, we may say that opponents of the system give the following reasons for their mental attitude: Co-education, they claim, is unnatural; the methods of instruction cannot be adjusted in the same institution to the physiological needs of each sex; the strain of competition falls unequally, especially upon young girls who, at this time of their life, are physically unable to study so continuously as men; this is the period when the association of the sexes is attended with the most danger; that, granting the refining effect produced upon young men by such association, women, being more exposed to criticism, will lose rather than gain the finer graces of social life; and, finally, that since the well-equipped women's colleges of the present day offer equal advantages with the co-educational institutions, the question is one of expediency rather than of absolute right or wrong, of relative mental capacity or of opportunity.

Those who defend the system reply that co-education is natural, because it follows the ordinary structure of the family and of society; in their opinion, the traditions and life of European universities are no criteria for America; the separation of the sexes in education is mediæval, partial, and out of harmony with the habits and sentiments of every-day life and the laws of the state; the average woman is capable of as much mental work as the average man; the moral tone is elevated by co-education, and the romantic fancies engendered by attendance on separate schools are dissipated, the commonplace reality of mutual rivalry being substituted; the humility produced by competition prevents the unsexing of women, and finally they claim that co-education secures greater economy in instruction, better discipline, an invaluable mental stimulus, and a higher standard of scholarship. Those most familiar with the working of co-educational institutions testify that experience has proved the groundlessness of the arguments against co-education. In their view, the presence of the two sexes has been a mutual restraint; the average standing of women has been equal to and often better than that of men; true ideas of manliness and womanliness have not suffered in consequence of the association; they do not find that women have proved burdensome by reason of inferior scholarship or maintained their equal standing at the sacrifice of health, nor that ill-advised marriages have resulted in larger proportions than among the educated classes generally.

The common school in the United States has always been a "mixed" school, containing both sexes, even up to the period of manhood and womanhood, and the graded schools of the villages, towns, and smaller cities resemble those of the rural districts. Even in most of the larger towns and cities, co-education is the rule. The first institution above the grade of a high school to practice it was Oberlin College, opened in 1833, which in 1837 admitted four young women to the regular Freshman class, and the next, Antioch College, opened in 1852. The school of fine arts, connected with Yale College,

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established 1864, was founded with the stipulation that there should be no distinction in the matter of sex. In 1870, Michigan University and Illinois Industrial University gave women permission to enter, and in 1872 Cornell University and the University of Vermont followed their example. Boston University, opened in 1871–72, admitted women from the beginning. The Pennsylvania College of Dental Surgery opened its doors to women in 1878, and among more recent examples is that of the National College for Deaf Mutes, at Washington, D. C., which, since 1886, has admitted young women on the same terms and conditions as men. The change of sentiment in favor of co-education can perhaps be best learned from the statement that, whereas there were in 1867, but twenty-two men's colleges open to women, in 1889, the number amounted to 200, the majority of these being at the west and southwest. Sentiment in the eastern states being generally averse to co-education in colleges, the lack of collegiate instruction for women has been supplied in several places by the establishment of affiliated institutions such as the Harvard Annex, and Barnard College in New York, while Colby University, after practising co-education for several years, discarded it in 1890, returning to the affiliated system.

In Canada, McGill University has been open since 1883, and Victoria, at Coburg, Queens, at Kingston, Dalhousie, at Halifax, and University College, at Toronto, admit women in full or in part. The leading universities of Australia, Melbourne, Sydney, and Adelaide, admit women to lectures and degrees, prizes, scholarships, and university privileges, and they are eligible as lecturers and professors, but in Melbourne they are debarred from membership of the senate. Less rapid advance would be expected in the southern part of the continent, but in 1875 a young lady of Cuzco, Peru, applied for permission to study for the degree of LL.D., at the university, and was informed by the minister of justice that the laws of the republic recognized no difference in sex in the matter of education. Since 1880 the higher schools of Mexico have received both sexes, and since 1884, the same has been true of the intermediate schools of some cities in the Argentine Republic. The Lyceum of Arts and Trades of Rio de Janeiro admits both sexes to its courses. Chili has a number of mixed elementary schools. At Cambridge, England, the students of Girton and other women's colleges attend the classes of most of the university professors, readers, and lecturers, sitting either at one side of the room or behind the men. University College in London, and University College in Liverpool admit women to most of their courses, and the same is true of a few other institutions for men.

The normal schools of Italy admitted women before 1861, and the universities admitted them before 1876, though not until that date were they placed on an equal footing with men. About 1860, the Russian medical schools were opened to women, and, although degrees were refused, the number of students increased so rapidly that the government withdrew permission, whereupon the students applied to the University of Zurich and succeeded in gaining entrance. As Zurich became a centre of Nihilism, an imperial ukase was issued in 1872, ordering the women to return, and re-opening to them the medical schools, though under restrictions and to a limited course. Some complied; the rest repaired to the University of Berne, and were received, and by that time the Polytechnic School, at Berne, and the Polytechnicum, at Zurich, had been thrown open to their sex, as well as the Concordat examinations, enabling them to practice in the cantons. Geneva soon after followed the example of the other universities. In 1868, Dr. Mary Putnam of New York, gained admission to the Paris school of medicine, where she graduated with honor in 1871. She was followed by Miss Mary Garrett, of England, and others, and women are still admitted, but must have special permission from the minister of education. In 1870 the University of Vienna began admitting women to degrees and as students in its classes, "where the professors do not object," and in that same year Sweden opened her universities. At Upsala women are on the same footing as men as regards rules and customs, but are not allowed to study theology and law. Since 1874 women have been admitted to the courses of the different faculties in France. In 1875 the University of Copenhagen opened all her classes and degrees except theology. Holland opened her gymnasiums and universities in 1877; the universities of Belgium followed in 1881. Leipsic admitted women from 1871–80, but Austria-Hungary, after trying the experiment, abandoned it in 1882, and Prussia, having allowed a few women to pass examinations between 1871 and 1880, finally and officially closed her universities against them. The universities of Spain, which, during the present century, at least, has permitted a few women to enter its universities, no longer allow co-education. The University of Christiania, Norway, opened its lectures to women in 1881, and in 1882 placed them on an equal footing with men. Finland established its first mixed school in 1883, and, passing to India, we find that Madras Medical College has had women students since 1875, and that nearly all courses are now open to them.

It has been urged that co-education implies co-educators, and that the two-fold influence of teachers is a point of greater importance than the influence of students on one another; also that the co-educational theory breaks down unless the faculties are opened to women. Instances are not wanting in the past of the admission of women to the faculties of men's universities, Italy furnishing the greatest number. At Bologna, Maddalena Buonsignori was professor of laws in 1380; Laura Bassi, professor of physics in 1733; Maria Agnesi, professor of mathematics in 1750, and Clothilde Tambroni, professor of Greek from 1794 to 1817, while in 1750, Anna Marandi Mozzolini, took the place, as anatomical lecturer, of her sick husband, and subsequently attained such

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celebrity that she was offered a chair at Milan. Other women were honored in like manner at Padua. See E. H. Clarke, *Sex in Education* (Boston, 1873); J. H. Fairchild, D.D., "Co-education of the Sexes" in *Report of U. S. Commissioner of Education* (1868), and *Circular of Information* No. 2 (1883), on co-education in the public schools.

COEFFI'CIENT (Lat. together-making) is the name given in algebra to the known or constant factor of an unknown or variable quantity. Thus, in the expressions $4x$ (4 times x), bz (b times z), 4 and b are coefficients of x and z b being supposed known as well as 4, and x and z unknown or variable.

COEHOORN, or **COHORN**, MENNO, Baron Van, called the Dutch Vauban, was b. at Lettingastate, near Leeuwarden, in 1641, and studied fortification and mathematics under his uncle Bernardus Fullenius, then professor of these sciences at Franeker. Prince Henry Casimir, stadtholder of Friesland, apprised of the youth's great abilities, appointed him, in his 16th year, capt. of a company of infantry; and in 1674, C. greatly distinguished himself at the siege of Maestricht, and in various battles. At the siege of Grave, in 1674, he demonstrated that small portable mortars might be advantageously employed (see next art.); and also that the combined effect of a certain mass of projectiles is much greater than the effect produced by a successive discharge of the separate projectiles composing the mass. The application of this principle distinguishes the operations of Coehoorn. C. covered himself with honor before Kaiserwerth (June) and Bonn Oct., 1689), and the elector of Brandenburg wanted to make him maj.gen., a promotion he refused. He also distinguished himself in the battle of Fleurus, (July 1, 1690). He was now for some time in disgrace, but was soon sought again by William III. He fortified Namur, and defended his own intrenchment "William" against Vauban in 1692; besieged that fortress in 1695, and retook it; was appointed lieut.gen. and director-in-chief of the Dutch fortifications, and fortified several towns, of which Bergen-op-Zoom may be considered his masterpiece. In 1702, he annihilated the French lines near St. Donat. He died at the Hague, Mar. 17, 1704.

COEHORNS—named from the military engineer who invented or introduced them—are small howitzers or mortars, generally 4⅘ in. calibre.

CŒLIAC AX'IS. See AORTA.

COEN, JAN PIETERSZOON, 1587–1630; the founder of Batavia, the capital of the Dutch East Indies. He went to India in 1607 on a commercial exploration, and in 1612 made his second voyage with two ships. The next year he was appointed director-general of the Indian trade, and in 1619 he destroyed the native town of Jacatra and founded Batavia on its site.

CŒN'OBITES (Gr. *koinos*, common, and *bios*, life), or SYNODITES, the name given to those monks who live together, in contradistinction to the anchorites (q.v.), or hermits, who withdraw from all society, and live in a solitary fashion. The first *cœnobium*, or monastery, was founded by Pachomius, a disciple of St. Antony, about the year 340 A.D., at Tabennæ, an island in the Nile.

COERCION ACTS. See IRELAND.

CŒUR, JACQUES, 1400–56; a native of Bourges, France, who opened trade between his country and the states of the Levant. In 1436, Charles VII. made him master of the mint just established in Paris, and in 1440 his family were ennobled. In 1444, he was sent as one of the royal commissioners to preside over the new parliament of Languedoc, and in 1448 he represented the French king at the court of Nicholas V., who treated him with great distinction, lodging him in the papal palace, and granted him a special license to traffic with the infidels. The power and fame of C. were now at their highest. He had represented France in three embassies, and had furnished the funds of the war that had driven the English from Normandy. He was invested with various offices of dignity, and possessed the largest fortune ever amassed by a private French citizen. The sea was covered with his ships; he had 300 factors in his employ, and houses of business in all the chief cities of France. He had built hotels and chapels, and had founded colleges in Paris, at Montpellier, and Bourges. Dealing in all things—money and arms, peltry and jewels, brocades and woolens—broker, banker, farmer—he had absorbed all the trade of the country, and merchants complained that they could make no gains on account of "that Jacques." Very soon, however, he was a broken man and a fugitive. Charles was surrounded with the great merchants; he was as unstable as water, and always needy. C. had to go the way of others who had been the friends of the king. In Feb., 1449, Agnes Sorel, the king's mistress, died of puerperal fever. But it was charged that Louis (the dauphin) had procured her death; and a considerable time after she died, C., who was one of her executors, was accused of having poisoned her. There was not even a pretext for such a charge; nevertheless, the needy and unscrupulous king, in July, 1451, ordered his arrest and the seizure of his goods, reserving for himself a large sum to carry on the war in Guienne. He was tried and convicted by men whose business it was to convict him without regard to the evidence or to justice; and he was condemned to do public penance, to pay to the king a sum equal to $5,000,000 of modern money, and to remain a prisoner until the judgment was fully satisfied. All his property was confiscated, and he was subject to exile during the royal pleasure. In 1455, he managed to escape into Provence, and, though closely pursued, succeeded in reaching Rome, where he was well received by the pope. Cœur died at Chios.

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COFFEE. This well-known beverage is an infusion of the roasted albumen of the seeds of the C. tree (*coffæa Arabica*), a native of Abyssinia and Arabia, but now naturalized in many of the tropical countries colonized by Europeans. There are a number of species of *coffæa*, but this one only is known to possess valuable properties; the seeds of *C. mauritiana* prepared in the same way, are bitter and slightly emetic. The genus belongs to the natural order *cinchonaceæ*. It has a tubular 4 to 5 cleft corolla, and a succulent fruit containing two cells lined with a cartilaginous membrane, and each containing one seed.

In a wild state, the C. tree is a slender tree of 15 to 25 ft. high, with few branches; in cultivation, it is seldom allowed to become more than 6 to 10 ft. high, and is made to assume a sort of pyramidal form, with horizontal branches almost from the ground. The leaves are evergreen, opposite, very shining, oblong, and leathery; the flowers are small, clustered in the axils of the leaves, and snow-white; the whole appearance of the tree is very pleasing; and the smell of the flowers is delicious. The fruit, when ripe, is of a dark-scarlet color, and the seeds are semi-elliptic, and of a horny hardness. The seeds are commonly termed *C. beans*, but this name is not derived from a resemblance to beans, which they have not, but from the Arabic word, *bunn*. They are sometimes, but very incorrectly, designated *C. berries*.

The C. tree succeeds only in countries where the average temperature of the year is about 64° to 70° F. In Peru and Quito, it is acclimatized at an elevation of 6,000 ft., where, however, frost never occurs; but as it delights in a moist atmosphere, it nowhere thrives better than in tropical islands. The fruit ripens in the hot-houses of Britain, where the C. tree frequently flowers. C. plantations are laid out pretty much in the same way everywhere. In quadrangles, bordered by fruit-trees, the C. trees stand in rows; they are pruned to the same height, and the ground between them is carefully kept clear of weeds. Where the climate is dry, abundant irrigation is necessary, but the supply of water is cut off as the fruit begins to ripen, in order to the improvement of its quality. The tree yields its first crop in the third year; the crop from a full-grown tree may amount to a pound of C. beans. As the C. tree continues flowering for eight months, its fruits are at any time of very unequal ripeness; in the West Indies and Brazil, three gatherings are therefore made annually. The beans are placed on mats or large floors specially adapted for the purpose, where they are dried by the sun's rays, being meanwhile frequently turned. They are passed between rollers to remove the dried pulp of the bean, and the membrane which incloses the seeds themselves, and the C. is afterwards freed from impurities by winnowing, and conveyed in bags to the seaports. As equal care is not, however, bestowed upon the preparation of it in all places where it is cultivated, there are great differences in quality and price.—The earlier history of the C. tree is not very clear. It was not known to the Greeks or Romans; but in Abyssinia and Ethiopia it has been used from time immemorial; and in Arabia it was certainly in use in the 15th c., and over the rest of the east in the 16th century. Towards the end of the 17th c., it was carried from Mocha to Batavia by Wieser, a burgomaster of Amsterdam, where it was soon extensively planted, and at last young plants were sent to the botanical garden at Amsterdam, from which the Paris garden obtained a tree. A layer of this was carried out to Martinique in 1720, where it succeeded so well, that in a few years all the West Indies could be supplied with young trees.

The following sorts are particularly distinguished from each other in commerce. *Mocha C.*, which comes from Arabia, and is known by its small gray beans inclining to greenish; *Java* or *East Indian C.*, which has large yellow beans; *Jamaica C.*, with beans somewhat smaller and greenish; *Surinam C.*, which has the largest beans; *Bourbon C.*, with beans pale yellow and almost whitish.

The employment of C. as a beverage was introduced from Arabia, in the 16th c., into Egypt and Constantinople. Leonhard Rauwolf, a German physician, was probably the first to make C. known in Europe, by the account of his travels printed in 1573. Soon after the first introduction of C., COFFEE-HOUSES arose almost everywhere. The first in Europe was established in Constantinople in 1551. In London, the first coffee-house was opened in Newman's court, Cornhill, in 1652, by a Greek named Pasquet. This Greek was the servant of an English merchant named Edwards, who brought some C. with him from Smyrna, and whose house, when the fact became known, was so thronged with friends and visitors to taste the new beverage, that to relieve himself from annoyance, Edwards established his servant in a coffee-house. The first coffee-house in France was opened at Marseilles in 1671, and in 1672 there was one opened in Paris, which soon had several competitors.

In Arabia and the east, C. is not usually prepared as a beverage in the same way as in Europe, except by Europeans. A decoction of the unroasted seeds is there generally drunk; and for the "sultan's coffee," the pericarp with the dried pulp roasted, is employed.

The great demand for C. has led to the employment of a number of cheaper substitutes, of which *chicory* (q.v.) root is the best known in this country. Of others, dandelion root, carrot, and the seeds of the common yellow iris may be mentioned. They are prepared by roasting like coffee. The seed of *astragalus bæticus*, already mentioned in the article ASTRAGALUS, are known on the continent of Europe as *Swedish C.*, and are

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said to be the best substitute for C. yet discovered. But all these substitutes want the most important constituent of true C., *caffeine;* and are therefore very different from it in their qualities. C. is subject to great adulteration, most of the articles specified as substitutes being employed for this purpose. The chief substance of mixture is chicory, the use of which is not injurious, however. A variety of coffee known as *Liberian Coffee*, a native of western Africa, is being introduced into some countries, particularly in Ceylon. It is a much coarser variety, but thus far, it has withstood the ravages of the leaf disease that had nearly destroyed the coffee plantations of that country.

The leaves of the C. tree are used in the western part of Sumatra instead of the seeds. They are prepared by quick drying in a manner similar to that in which tea-leaves are prepared; and in this state contain even a larger proportion of caffeine than the C. beans of our shops. It seems not improbable that the use of the C. leaf may yet extend very much.

C. owes its exhilarating and refreshing properties to the presence of three substances: 1. *Caffeine* (q.v.), which occurs in the roasted bean to the extent of ¼ to 1 per cent; 2. A *volatile oil*, which is not present in the raw bean, but is developed during the process of roasting to the extent of only one part in about 50,000 of the roasted C.; and 3. Astringent acids, resembling tannic acid, but called caffeo-tannic and caffeic acids. The average composition of unroasted C. is as follows.

Caffeine	0.8
Legumin (vegetable caseine), (q.v.)	13.0
Gum and sugar	15.5
Caffeo-tannic and caffeic acids	5.0
Fat and volatile oil	13.0
Woody fiber	34.0
Ash	6.7
Water	12.0
	100.0

When the beans are roasted till they assume a reddish-brown color, they lose 15 per cent by weight, and gain 30 per cent in bulk; when further roasted till they become chestnut-brown, they have lost 20 per cent by weight, and increased 50 per cent in bulk; whilst if the roasting is continued till the beans become dark-brown, they lose 25 per cent in weight, and acquire 50 per cent in bulk. The beans should never be darker than a light-brown color, which is quite sufficient to bring out the excellent aroma and other qualities of the C.; and when the roasting is carried further, more or less charring is the result, and a disagreeable burned smell is produced, which tends to overcome the natural pleasant aroma.

C. does not retard the action of the bowels, as strong infusions of tea tend to do, partly because there is less of the astringent principle, and also owing to the presence of the aromatic oil which tends to move the bowels. The important offices which C. fulfills are, to allay the sensation of hunger; to produce an exhilarating and refreshing effect; and, most important of all, to diminish the amount of wear and tear, or waste of the animal frame, which proceeds more or less at every moment. See NUTRITION. The grounds of C. are very nutritious, from containing so much legumin; and some of the eastern nations take advantage of this, and use the grounds as well as the infusion. In other respects, C. possesses similar properties to tea (q.v.).

An endless variety of apparatus have been contrived—some of them of great complexity—for preparing C. for the table. The chief object aimed at is, to obtain the liquor free from all sediment. One of the simplest and cheapest of these contrivances is the percolating coffee-pot. The easiest way of making C.—requiring no special apparatus, and as satisfactory in the result perhaps as any—is to put two ounces of (fresh-roasted and fresh-ground) C. into a small saucepan or common coffee-pot; pour over it a pint of boiling water, and allow it to stand, closely covered up, by the side of the fire (but *not* to boil) for five minutes. The liquor may then be simply poured off the grounds, or it may be strained through a cloth, and then returned to the saucepan or coffee-pot (previously rinsed out), and warmed again. Soyer recommends, that before the boiling water is poured in, the saucepan should be set dry on the fire, and the powder stirred till it is quite hot, but not in the least burned. In France, a pint of boiling milk is added to a pint of coffee. The chief effect of adding chicory to C. is to deepen the color.

ESSENCE OF COFFEE is a highly concentrated infusion, mixed to the consistence of treacle with extract of chicory and burned sugar, and kept in well-corked bottles. By pouring boiling water upon a tea-spoonful of the essence, a cup of very tolerable C. may be prepared in a moment.

The trade in C. is of great importance. The following statement is given in *M'Culloch's Commercial Dictionary* as "a pretty fair estimate" of the comparative exports of C. from the principal places where it is produced, and of the annual consumption in those countries into which it is imported from abroad:

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EXPORTS.

	Tons.
Mocha, Hodeida, and other Arabian ports	8,000
Java	55,000
Sumatra and other parts of foreign India	8,000
Brazil and the Spanish main	160,000
Hayti	16,000
Cuba and Porto Rico	7,000
British West India colonies	2,000
India and Ceylon	38,000
Dutch West Indies	2,000
French West Indies and the Isle de Bourbon	2,500
	298,500

CONSUMPTION.

	Tons.
Great Britain	16,000
Netherlands and Holland	40,000
Germany, Russia, and countries round the Baltic	60,000
France, Spain, Italy, Turkey in Europe, the Levant, etc	55,000
The United States	90,000
Canada, Australia, etc	30,000
	291,000

The average consumption of coffee in the United States is given by Mulhall as 215,000 tons. The importation of coffee into the United States in 1895 was 652,208,975 pounds, valued at $96,130,717. Deducting the amount exported, the average consumption per capita is 8.04 lbs.

COFFEE, a co. in s.e. Alabama, watered by Pea river and its tributaries; area, 700 sq. m.; pop. '90, 12,170, with colored. Surface hilly, and soil for the most part poor, with abundance of pine timber. Productions, agricultural. Co. seat, Elba.

COFFEE, a co. in s.w. Georgia, between the Ocmulgee and the Allapaha rivers, reached by the Southern and the Brunswick and Western railroads; 1145 sq. m.; pop. '90, 10,483, includ. colored. It has a level and sandy surface, producing corn, oats, rice, cotton, etc. Co. seat, Douglas.

COFFEE, a co. in central Tennessee, intersected by the Nashville, Chattanooga, and St. Louis railroad; 360 sq. m.; pop. '90, 13,827, includ. colored. Surface hilly and soil fertile; producing wheat, corn, cotton, etc. Co. seat, Manchester.

COFFEE BUG, *Lecanium coffeæ*, an insect of the coccus (q.v.) family, which lives on the coffee-tree, and is often extremely destructive to coffee plantations. It has of late years devastated some of these in Ceylon. To check its ravages, the experiment was tried of introducing into the plantations the red ant (*formica smaragdina*), abundant in many of the gardens and jungles of the island, which feeds greedily on the C. B.; but the fierce assaults of the ants on the naked skins of the Malabar coolies, made them threaten to leave the estates.

COFFEE-TREE, KENTUCKY. See GYMNOCLADUS.

COFFER, in fortification, is one particular kind of *caponnière* (q.v.).

COFFER, a deep panel in a ceiling, also called a caisson.

COFFER, a casket for keeping jewels or other valuables. Caskets and chests were sometimes made of iron, but more frequently of wood.

COFFER-DAM, a water-tight structure used in engineering for excluding the water from the foundations of bridges, quay-walls, etc., so as to allow of their being built dry. Coffer-dams are generally formed of timber piles driven close together (called sheeting) in two or more rows, according to the depth of water and the nature of the bottom; the space between the rows, which may vary from four to ten feet, being spooned out, down to the solid and impervious bottom, and filled up with clay puddle. Sometimes they are made of only one row of piles of the full height, calked above low-water, with a low or dwarf row outside to confine the puddle up to that level, or, where there is no wave or current, with a mere bank of clay thrown against the outside; and occasionally the upper work is formed of horizontal planking, fixed on open main piles, and calked in the joints. When the bottom is rock, so as to prevent piles being driven, and is not much below low-water, coffer-dams are occasionally formed of two stone-walls, with a space between filled with clay.

The coffer-dams before spoken of are all what are called high-water dams, and exclude the water at all states of the tide. They require to be provided with sluices, to allow of the water, when first to be excluded, getting out during the ebb, and to shut against it during the flood. The remainder of the water, and all leakages, must be got rid of by pumps, generally worked by a steam-engine. For moderately shallow foundations, and

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more especially where there is a great rise and fall of tide, tidal-dams are often used These are sometimes made of sheeting piles, but are often boxes formed of planking or of iron, weighted and sunk into the ground by digging inside in the same way that wells are sunk. These dams can only be used for a couple of hours or thereabouts at low-water, and, of course, require to be pumped out every tide. All coffer-dams require to be strongly shored within, to prevent their being forced inwards by the pressure of the external water; and the rows of piles require to be strongly bolted together, to overcome the pressure of the clay puddle, which otherwise would burst them.

COFFEY, a co. in s.e. Kansas, intersected by the Neosho river, and traversed by the Missouri, Kansas, and Texas railroad. The business is almost exclusively agricultural. Co. seat, Burlington. Pop. '90, 15,856. Area, 648 sq.m.

COFFIN (Lat. *cophinus*, Gr. *kofinos*, in both languages signifying a basket, coffer, or chest, but never a coffin). In the ordinary English sense of the word, a C. is a chest or box in which dead bodies are buried or deposited in vaults; but the term is also applied to a mold of paste for a pie, and, in printing, to the wooden frame which incloses the stone on which the form is imposed. In farriery, it signifies the hollow part of a horse's hoof. It is in the first of these significations alone that we shall consider it here.

It has been keenly disputed amongst scholars, whether it was more usual with the Greeks to bury their dead, or to burn them (see BURIAL); but both customs unquestionably prevailed, and coffins, in the modern sense, were consequently known in Greece. They were called by various names (*soroi*, *pixeloi*, etc.), and composed of various materials, the most common being baked clay, or earthenware. Their forms also varied, sometimes resembling those which we use, sometimes consisting of a narrow triangular box, the undermost side of course being considerably broader than the others. In Rome, the ancient practice was to bury the dead, not to burn them; though under the empire, and previous to the recognition of Christianity, the latter custom became almost universal. The C. in Rome was called *arca* or *loculus*, and was frequently made of stone, sometimes of a peculiar kind of stone brought from Assos, in Troas, which was said to consume all the body except the teeth in forty days, and which, from this circumstance, was called sarcophagus—an eater of flesh. See SARCOPHAGUS. Many Roman stone-coffins have been found in Great Britain. The simplest of all coffins was that used by the British Celts and other rude nations, consisting of unhewn stones set on their edges, so as to cover the sides and ends of the grave, one or more flat stones being then laid over the body to form a lid. To these succeeded stone-coffins, which were commonly used for persons of the higher classes in Saxon times, and throughout the whole of the middle ages.

From Bede, however, we learn that the Saxons occasionally employed wood; and the common people, both then and in the subsequent Norman and English eras, were simply wrapped in cloth, and so put into the ground. The same custom seems to have been followed with monks down to a comparatively recent period. Stone-coffins were generally of a single block, commonly tapering from the upper end. In the hollow for the reception of the body, there was generally a part peculiarly fitted for the head, and a hole in the bottom to allow of the juices of the decaying body to escape. These coffins, for the most part, were not buried very deeply in the earth, and were frequently placed so near the surface that the lids were visible, which, within a church, often formed part of the pavement. Sometimes they were even above the ground altogether, and thus became the originals of altar-tombs. These lids were often covered with elaborate sculpture, representing crosses and other ornaments. Leaden coffins were occasionally used in the middle ages, as those recently brought to light in the temple church in London testify, but the slight wooden cases now in common use appear to be of comparatively recent origin. See Strutt's *Manners and Customs*, and Gough's *Sepulchral Monuments*.

COFFIN, CHARLES CARLETON; b. Boscawen, N. H., 1823; educated at Boscawen and Pembroke academies. He became a civil engineer, 1845–46; in 1849 built a telegraph line from Harvard observatory to Boston. He constructed the telegraphic fire alarm in Boston, and gave the first alarm, 1852, Apr. 29. In 1861 he became the war correspondent, "Carleton," of the Boston *Journal*; and in 1866 sailed on a two and a half years' voyage round the world as correspondent of that paper. His books are: *My Days and Nights on the Battlefield, Following the Flag, Winning his Way, Four Years of Fighting, Great Boston Fire, Our New Way round the World, Seat of Empire, Caleb Crinkle, Boys of "'76," Story of Liberty, Old Times in the Colonies, Building the Nation, Life of Garfield*; and *Daughters of the Revolution and Their Services* (1895). He d. in 1896.

COFFIN, Sir ISAAC, 1759–1839; b. Mass.; went into the British naval service in 1773, and rose through all grades to admiral. In 1818, he was elected to parliament, where he remained until 1826. In the latter year he founded a school in Nantucket, which is still called by his name; indeed, the name was once almost a common noun in that island, so numerous were the families that owned it.

COFFIN, JOHN HUNTINGTON CRANE, LL.D.; b. Me., 1815, graduate of Bowdoin college; in 1836, appointed professor of mathematics in the U. S. navy. In 1844 he was detailed to the naval observatory, and from 1866 was in charge of the *American Ephemeris and Nautical Almanac*. He d. in 1890.

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COFFINBONE (Lat., *os pedis*, "bone of the foot"), in a horse, is a small spongy bone. very liable to disease, in the middle of the hoof. It is also known as the distal phalangeal bone and as the third or ungual phalanx.

COGHETTI, FRANCESCO, b. 1804; an Italian painter who has executed many fine altar pieces in the churches of Bergamo and elsewhere. He painted for the villa Torlonia the exploits of Alexander the Great. He is recognized as the head of a modern school who strive to restore the classical styles of painting. He d. in 1875.

COGHLAN, ROSE (Mrs. John T. Sullivan); b. London, 1852; began her career as actress at the Greenock theatre, Scotland. She was for a long time the leading actress at Wallack's theatre, New York.

COGNAC, a t. of France, in the department of Charente, with a pleasant situation on an old castle-crowned hill overlooking the river Charente. C. is celebrated as the place where the best brandy in France is manufactured, to which it gives its name. Not half the quantity of so-called *Cognac* brandy, however, is manufactured here. The cultivation of the vine and distillation of brandy form the chief industry of the inhabitants of the district. Francis I. was born here. Pop. of commune, '91, 17,392.

COGNATE. See AGNATE.

COGNIARD, THÉODORE, 1806–72; a dramatist of Paris, who, with his brother, Hippolyte, wrote a great number of fairy plays, vaudevilles, and other light pieces, which were unusually successful. Some of them are *La Biche aux Bois; Belle Hélene; Barbebleue; Perichole;* and the *Grande Duchesse.*

COGNI'TION AND SA'SINE, in Scotland, a form of entering an heir in burgage property. See CONVEYANCING.

COG'NIZANCE, a term used in a loose manner in heraldry, sometimes to signify a crest (q.v.), sometimes a badge (q.v.), or other distinguishing mark.

COGNO'MEN, equivalent to family name or surname. A Roman of any social position ordinarily had three names, the last being his C. and the name by which his family was known. In Marcus Tullius Cicero, the first name is the *præ-nomen*, the second the *nomen*, and the third denoted the family, or *gens*. See NAME.

COGNOSCEN'TI (Ital., from Lat. *cognosco*, to know), persons professing a critical knowledge of works of art, and of a somewhat more pretentious character than amateurs.

COGNO'VIT, viz., *actionem* (he has confessed the action), in the law of England, is the defendant's written confession that the plaintiff's cause against him is just and true. A C. usually proceeds on the condition that defendant shall be allowed a certain time for the payment of the debt or damages and costs; and it impliedly authorizes the plaintiff's attorney to do everything necessary to obtain judgment.

COGSWELL, JOSEPH GREEN, LL.D., 1786-1871; b Mass.; graduate of Harvard in 1806. He studied law with Fisher Ames, but did not continue its practice, preferring to be a tutor at Cambridge. In 1816, with George Ticknor and Edward Everett, he traveled in Europe, where he paid special attention to the methods and principles of instruction. In 1820, he was made professor of mineralogy and geology, and librarian of Harvard college. In 1823, with George Bancroft, he founded the Round Hill school at Northampton, Mass. About 1839, he settled in New York, where he was employed by John Jacob Astor, and became chief adviser of the millionaire in establishing the Astor library, one of the most valuable collections in the country. Under C.'s superintendence the library took form and grew up to completeness, and he remained its leading spirit as long as his health would permit, retiring from the superintendence in 1863.

COG-WHEEL. See WHEELWORK, GEARING.

COHASSET, a town in Norfolk co., Mass., 20 m. s.e. of Boston, on the New York, New Haven, and Hartford railroad; pop. '90, 2448. The town borders on Massachusetts bay and on Plymouth county. Northward from C., the peninsula of Nantasket stretches towards Boston harbor. The people of C. are engaged chiefly in farming and fishing. There are Beechwood and North Cohasset villages, high school, public library, savings bank, etc.

CO-HEIR' AND **CO-HEIR'ESS,** one of two or more persons, among whom an inheritance is divided. See HEIR, SUCCESSION.

COHE'SION is the name to given that species of attraction (q.v.) by which the particles of matter are held together so as to form bodies (see ADHESION), and its measure is the resistance which bodies offer to any mechanical force tending to separate their parts. In gaseous bodies, C. is altogether wanting; their atoms even repel one another. In liquids, notwithstanding the ease with which the particles slide on one another, the operation of C. is distinctly seen in the formation of drops. C. is strongest in solids; and degrees of C., in this case, are much the same thing as degrees of solidity. It is the force of C. that constitutes the strength of materials (q.v.). After the particles of a body have been completely separated, it is found that through C. they will reunite, if pressed sufficiently close together. Two clean, smooth, freshly cut pieces of lead placed together, will cohere so as to require a very considerable force to separate them; and it

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has not unfrequently happened in plate-glass manufactories, that polished plates of glass have cohered so completely that they have been cut and worked as a single piece.

If the particles of matter had no property in relation to one another, except their mutual impenetrability, the universe, it has been said, would be like a mass of sand, without variety of state or form. As it exists, however, it demonstrates the cross-action of several universal properties of matter. Among those which most affect its state and form, are heat and cohesion. It may be said that bodies assume the solid, liquid, or aëriform states, just according to the proportion that the C. of their particles bears to those forces which, like heat, tend to separate them. See HEAT. Upon modifications of the cohesive force, and its relations to other molecular forces, would seem to depend such properties as elasticity, brittleness, ductility, etc.

COHESION-FIGURES, a remarkable class of figures produced in liquids by the action of their natural cohesive attraction for the surfaces of other liquids or solids on which they are deposited, or by induced cohesive attraction effected by the means of electricity. They may be described under four heads: (1) The surface-cohesion figures of Tomlinson; (2) The submersion-figures of Tomlinson; (3) The breath-cohesion figures of Strethill Wright; (4) The electric-cohesion figures of Strethill Wright.

1. *The Surface-cohesion Figures of Tomlinson.*—This class of figures was submitted to the chemical section of the British association by Mr. Charles Tomlinson of King's college, London, in 1861. He showed that a drop of an "independent liquid," such as an oil, alcohol, or ether, when gently placed upon chemically clean water, spreads itself out into a definite figure as it enters into solution or diffuses itself over the surface. He stated that each figure is characteristic of the fluid employed, and that any change in the chemical or molecular state of the fluid is attended with a corresponding change in its "cohesion-figure." Hence he recommended that these figures should be applied to the qualitative analysis of various liquids whose ordinary methods of testing were inoperative or inadequate. *Cohesion analysis*, performed as he directs, has been applied with signal success in the verification of oils and balsams, and as a ready means of indicating the changes which take place in those bodies by age or oxidation. The cohesion-figures of Tomlinson, from their great beauty and variety, combined with the exquisite harmony of coloring displayed by many of them, have been employed, like those of the kaleidoscope of Brewster, to suggest forms for the pattern-designer.

In the production of cohesion-figures, water was the receiving surface generally employed by their discoverer; but in certain cases he also employed other fluids, such as mercury, acetic acid, cocoanut-oil and castor-oil in the cold state; and spermaceti, white wax, lard, and sulphur in a state of fusion. On each of these substances, the liquid to be tested formed a different and characteristic figure, and hence additional means of comparison and verification were afforded.

2. *The Submersion-figures of Tomlinson.*—In the *Philosophical Magazine* for June, 1864, this author brought forward a new series of cohesion-figures of liquids, in which the drop, being of great specific gravity, instead of forming a figure on the surface, sank beneath it, and formed a figure as it slowly made its way to the bottom of the vessel. In order to exhibit these phenomena, he employed a column of liquid in a cylindrical vessel. He states that a solution of cochineal dropped into water formed a figure typical of a large class of these figures. A drop laid on the surface sank down, opened into a ring, which became depressed at two opposite points; from these points, lines of fluid descended, which terminated in secondary rings; the secondary rings, in like manner, drooped down into lines carrying tertiary rings, and so on, until the lower part of the vessel became crowded with a complicated system of drooping rings and lines. Oil of lavender in a column of alcohol, fusel oil in paraffin oil, in benzole, in ether, etc., gave various and distinctive figures. He found that similar figures were obtained by the use of oils dropped into columns of hot spermaceti, lard, wax, etc.; and that these figures underwent considerable variation under the influence of change of temperature. We have already stated that each of these figures, whether surface-figures or submersion-figures, is characteristic of the fluid which forms it; and Tomlinson considers, with regard to the *surface-figure*, that it is a function of the cohesive force and diffusibility of the liquid, and the adhesion of the surface on which it is deposited; he also considered that it might be a function of the solubility and the diffusibility of the fluid in question, or of the solubility, the density, and the molecular attraction; while with regard to the *submersion-figure*, he thought each figure to be a function of the solubility, the density, and the molecular attraction.

3. *The Breath-cohesion Figures of Strethill Wright.*—These figures were discovered by Dr. Strethill Wright of Edinburgh, and communicated to the royal Scottish society of arts on Dec. 12, 1864. This author, who had long been engaged in observing phenomena connected with the modification of cohesive attraction produced between solids and fluids by heat and electricity, was induced to take up the subject afresh by the publications of Tomlinson, and one of the results was the production of his so-called "breath cohesion figures." He employed as the recipient surface a freshly-split, and therefore chemically clean, surface of mica; on this he placed a single drop of the fluid to be experimented on. He then breathed upon the surface, and instantly the drop flashed out into a figure characteristic of the fluid of which it was composed. By this means,

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a variety of substances, such as vegetable extracts, tinctures, and essential oils, and animal fluids. such as serum, vaccine lymph, bile, mucus, and urine in its various pathological conditions, could be examined. By dusting the figures with hair-powder or lycopodium, he was also enabled to render them permanent, and to exhibit them in his lectures, expanded to a diameter of 14 ft. by the oxyhydrogen microscope. In general appearance, the breath-cohesion figures bear a strong resemblance to vegetable forms, especially to the fronds of the *desmidieæ*. In many of them, as in the *desmidieæ*, a very distinct bilateral symmetry is apparent. Others, again, simulate the forms of the larger *algæ*. A great many are resplendent with the hues of the soap-bubble, arranged in concentric bands and curves of excessive beauty; while others are veined throughout so as to resemble sections of agate. Dr. Wright considers that the breath-cohesion figure is the product of electric attractive force developed on the freshly-split mica, as a well-known consequence of cleavage.

4. *The Electric-cohesion Figures of Strethill Wright.*—These figures were described by Dr. Wright to the Royal Scottish Society of Arts on April 11, 1864, and are produced by electrifying drops of various fluids placed on a clean plate of glass, vulcanite, mica, or other smooth non-conducting substance. By this method, an endless variety of beautiful dendritic figures are produced, differing not only with the fluid employed, but also with the slightest change in the character of the surface on which it is placed, and with the electricity, whether positive or negative, which is imparted to the drop. The electric-cohesion figures are produced in the following manner: A sheet of plate-glass is laid upon a plate of blackened metal, and in the center of the glass a drop of the fluid to be operated on is deposited with a clean glass rod. The metal plate and the drop are then connected with the opposite poles of an induction coil (capable of giving a spark of about half an inch in length) in full action, and immediately branches protrude from the drop, which slowly creep over the glass until they closely cover a circle of 4 or 5 inches. Sulphuric acid, and solutions of potash, deliquescent salts, and organic fluids, give the best figures; while nitric and muriatic acids and distilled water do not form figures under the electric influence.

COHOES', a city in Albany co., N. Y., at the junction of the Mohawk and Hudson rivers and the e. terminus of the Erie canal, at its junction with the Champlain canal; reached by both the Delaware and Hudson and the New York Central and Hudson River railroads; 9 miles n. of Albany. The city is furnished with unlimited water-power by the Mohawk, which here has a fall of 70 feet. A dam above the falls holds back the water, which is supplied to the mills and factories by canals. There are immense cotton-mills, woolen-mills, knitting-mills, rolling-mills, axe-factories, pin-factories, and many other branches of manufacturing industry. There are electric lights and street railroads, improved water-works, national bank, public library, St. Bernard's Academy, many handsome churches, and daily and weekly newspapers. Pop. '90, 22,509.

CO'HORT, in the ancient Roman armies, was a portion of a legion, consisting usually of 600 men. Generally, there were ten cohorts to a legion (q.v.). See CENTURION.

COHOSH', the Indian name of black snake-root. It is regarded as a stimulating tonic, tending to diminish the force and frequency of the pulse. It is used to a great extent as a specific for rheumatism and cholera.

COHUNE' OIL, a fixed oil obtained from the kernel of the fruit of *attalea cohune*, a palm (see ATTALEA), abundant in Honduras and the isthmus of Panama. The oil is said to be of the finest quality, and to burn twice as long as the best cocoa-nut oil. The tree attains a height of only about 40 ft., but its leaves are 80 ft. long, and each leaflet measures 3 feet. The sap is drawn off for palm-wine.

COIF (Fr. *coiffe*, Ital. *cuffia*, a cap), a covering for the head in general, but more especially for the circular portion on the crown, which the Roman Catholic clergy are in the habit of shaving, and which is thence called the tonsure. The general meaning of the word is preserved in the verb to coif, coiffed, etc., and still more decidedly in the noun *coiffure*, which, so late as Addison's time, was English as well as French. Its special signification is now limited to the caul or cap worn by sergeants-at-law. It is now the only reminiscence of the tonsure amongst lawyers. On attaining the DEGREES OF THE C., or becoming a sergeant, a barrister retires from the inn of court by which he was called to the bar, and becomes a member of sergeants' inn.

COIF, among the armor of the middle ages, was a sort of defensive hood, surmounted by a helmet, sometimes continuous with the hauberk, and sometimes separate.

COIMBATORE', a city in the province of Madras, capital of a district of the same name, situated near the left bank of the Noyel, a tributary of the Cauvery from the right, in lat. 11° n., long. 77° 1′ east. It occupies the south declivity of the Neilgherries, 1483 feet above the sea, near the point where those otherwise isolated mountains connect themselves with the Western Ghauts. Almost immediately to the south of the junction of the two chains, the remarkable depression of Palghatcheri traverses the Western Ghauts from east to west, so as to afford a free passage for both the monsoons—the northeast and the southwest—in their respective seasons. C., from its proximity to this great gorge, is admirably ventilated during most of the year. This peculiarity, backed by the elevation, tends to promote the salubrity of the place, which,

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however, is seriously impaired by the brackish character of the wells. In the neighborhood is a very large tank. Pop. '91, 46,400. C. is on the line of railway from Madras to the w. coast.

COIMBATORE, a district in the province of Madras in lat. 10° 14′ to 11° 19′ n., and long. 76° 36′ to 78° 16′ e., containing 7,860 sq. m. and (1891) 2,005,000 inhabitants. Lying to the n.e. of the state of Cochin, it is almost entirely beyond the Western Ghauts. Besides the capital above described, there are in the district the towns of Palaghat and Darrampoor.

COIM'BRA, a city of Portugal, capital of the province of Beira, situated on the right bank of the river Mondego, here crossed by a stone bridge, 110 m. n.n.e. of Lisbon. Built round a conical hill, rising abruptly from the river, and surrounded by olive-gardens and orange-groves, its appearance from a distance is as beautiful as it is picturesque. Interiorly, however, it is not so attractive, its streets being steep, narrow, and dirty. Great historical interest attaches to C., which appears to have been originally built by the Goths. From them it passed to the Moors, from whom it was finally conquered in 1064, by Fernando the great, aided by the gallant Cid. On the erection of Portugal into a kingdom, in 1139, C. was made the capital, and continued so about two centuries and a half. Of the public buildings, the most noteworthy are the cathedral, the churches of San Francisco and San Salvador, the convents of Santa Cruz and Santa Clara, and a fine aqueduct of 21 arches, dating from the 16th century. The university of C., the only one in Portugal, was originally established in 1290, but permanently transferred here in 1537. It has faculties of law, theology, medicine, mathematics, and philosophy. Attached to the university are museums, an observatory, a botanical garden, and a library. C. has manufactures of linen, woolen, earthenware, and combs. Population, '90, 17,329.

COIN is money made of metal—in the United States, of gold, silver, nickel, and copper. In ante-revolutionary times, and before the adoption of the present Constitution of the United States, the various colonies and states, so far as they found occasion, made their own coins, which afford interesting study for the numismatist. The coinage laws of the United States have undergone a variety of changes since 1792, when the first code was adopted. In 1873 an act was passed by congress consolidating the regulations governing the coinage of the country, in conformity with the advice of John Jay Knox, comptroller of the currency. Gold and silver, on account of their softness, require, when used for coins, to be hardened by alloy. The gold coins are made of metal consisting of 900 parts pure gold and 100 of alloy; the alloy being 1 part of silver and 9 of copper. Gold of this quality is called standard gold. Silver coins are hardened by the same proportion of copper. The gold dollar weighs 25.8 grs. of which gold 9.10 fine, 23.22 grs.; the quarter-eagle ($2.50), 64.5 grs.; the half-eagle ($5), 129 grs.; the eagle ($10), 258 grs.; and the double eagle ($20), 516 grs. The gold coins are a legal tender to any amount. The silver coins are the dollar, 412½ grs.; the half-dollar (50c.), 12½ grams, or 192.9 grs.; the quarter-dollar (25c.), the dime (10c.), the half-dime (5c.), each of proportionate weight according to its relative value. The trade dollar containing 420 grains was coined especially for use in China. Coinage was discontinued in 1878. (See MONEY.) The silver coins of less value than a dollar are a legal tender to the amount of $10 in one payment. The one-cent pieces are composed of 95 per cent. of copper and 5 per cent. of tin and zinc. The five-cent nickel piece contains 75 per cent. copper and 25 per cent. nickel. Nickel and copper coins are a legal tender to the amount of 25 cents in one payment. Individual citizens are not permitted to coin money; as the Constitution forbids any state to do so, and hence, by implication, its individual citizens. See FOREIGN MONEY, VALUE OF.

CÖIN', a t. of Andalusia, Spain, about 21 m. w. of Malaga. It is pleasantly situated on a declivity, with wide clean streets, and environed with fine public walks and gardens. It has manufactures of linen and woolen, soap, paper, etc., and in the vicinity marble and jasper are obtained. Pop. 9,800.

COIN'CIDENCE. If, when two geometrical figures are laid upon one another, the boundaries of the one fall everywhere exactly upon those of the other, the figures are said to *coincide*. Such figures are considered as identical; and this C. is taken by Euclid as the test of equality, or rather, as the definition of equality. It is not necessary, in geometry, actually to lay the one figure upon the other; if we know the equality of certain parts, we can infer with certainty that the whole figures *would* coincide, if superimposed, and that the other parts are therefore equal too.

COINING See MINT, NUMISMATICS, MONEY, CURRENCY.

COINING, in law. Congress has the constitutional power to coin money and regulate the value thereof. The coining of spurious coin is therefore an offense directly against the Federal Government. A coin is a piece of metal stamped and made legally current as money. A counterfeit coin is one made in imitation of the genuine. The resemblance of the spurious to the genuine coin must be such that it might deceive a person using ordinary caution, and a conviction for counterfeiting cannot be had for uttering pieces of metal which are not in the likeness of genuine coin.

Not only the making, but the importation into the United States of spurious coin

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with intent to pass them, and the possession of any counterfeit current gold, silver or minor coin with intent to utter it have been made offenses by the statutes. In these cases a knowledge of the spurious character of the coin must exist to constitute the offense. The offense of counterfeiting also includes the mutilating of coin and the debasement of coin by officers of the mint. Foreign coins which are by law made current or are in actual use and circulation come under the laws for United States coin, but counterfeiting a foreign coin not so current is not punishable under the statute. Where a coin which had been regularly coined at the mint was afterwards punched and mutilated, and an appreciable amount of silver removed from it, and the hole plugged up with base metal or any other substance than silver, it was held to be counterfeiting: but it was otherwise where the hole was punched with a sharp instrument leaving all the silver in the coin although crowded into a different shape.

All those who take part in the work of counterfeiting are guilty of the offence as principals. So where one puts the finishing touches to spurious coin, so as to make them fit for circulation, as by brightening them, he is guilty of the offence. In many states the possession of instruments and appliances adapted and designed for coining or making counterfeit coin, with the intent to use the same or permit the same to be used in coining, is made indictable by statute. To offer, whether accepted or not, a counterfeit coin or bank bill with a representation by words or actions that the same is genuine, is an uttering under the statute. The crime of passing counterfeit money consists of knowingly passing it. The offence of uttering and passing counterfeit coin is not a felony, but a misdemeanor, although punishable by imprisonment in a state prison.

COIR, or Co'coa-nut Fi'ber, the fiber of the husk of the cocoa-nut, much used for making ropes, mats, etc. The husks are steeped in water, in pits, for six months, or even for a year, and then beaten with a stick till the fiber readily separates. C. is now well known as one of the best materials for cables, on account of its lightness, elasticity, and strength. C. ropes are produced in great quantity in the Laccadive islands. They are entirely made by the hand—chiefly by women—without the aid of machinery of any kind. The manufacture of cocoa-nut mats is now carried on to a considerable extent in Britain, the husks being imported for that purpose. This manufacture is one of the branches of industry in which children are employed in the industrial or ragged schools, and criminals in prison.

COIRE. See Chur.

COIT, Thomas Winthrop, D.D., LL.D., b. Conn., 1803; a graduate of Yale; rector of St. Peter's (Episcopal) church, Salem, Mass., in 1827, and two years later of Christ church, Cambridge. In 1834 he was chosen president of Transylvania university; in 1854 he was elected professor of ecclesiastical history in Berkeley divinity school, Middletown, Conn. Dr. C. published *A Theological Common-place Book; The Bible and Apocrypha in Paragraphs and Parallelisms; Remarks on Mr. Norton's Statement of Reasons; Puritanism, a Churchman's Defence against its Aspersions; Lectures on the early History of Christianity in England*, etc. He d. 1885.

COIX. See Job's Tears.

COJUTEPEC', a t. of San Salvador, Central America. It is situated 15 m. to the e. of the city of San Salvador, destroyed by earthquake in 1854, and was the seat of government from that year until 1858. C. has a pop. of about 5000.—At the distance of a few leagues, a lake of the same name measures 12 m. in length by 5 m. in average breadth; and in windy weather it assumes a green hue, often casting on its shores vast quantities of dead fish.

COKE is that part of coal which remains after its volatile matter has been driven off by heat. There are two kinds of coke recognized, viz., gas coke and oven or pit coke. The former is of less value, and is considered merely as cinder, being a by-product of the manufacture of illuminating gas. C. was used in England for locomotives almost exclusively at one time, but at present its use on locomotives is very limited, being used only where it is necessary to avoid smoke. It has never been used on American railroads. Its most important use is in metallurgical work, in which its freedom from sulphur is of great value. Oven C. and pit C. are so named according to their method of production. For the former an oven is used, the most general size of which is about 12 ft. in diameter and 10 ft. high, covered with an arched top with a hole for the escape of the gases. A door for the admission of air is placed in front at the bottom. Two tons of coal are placed in the oven and the coal is ignited from the heat of the previous charge. Air is admitted by means of the bottom door for about 24 hours and the door is then closed, while for 12 hours more the gases are allowed to escape at the opening on top. The mass is then allowed to cool to a certain extent, after which it is removed and water sprinked over it to stop all ignition. It is stated that some ovens in England have been built as large as 30 ft. square, holding a charge of 8 tons of coal spread 4 ft. deep.

In the U. S., open heap coking is the usual method of production, and is called the Meiler method. Ranges of coal are piled up about 6 ft. high, 12 ft. thick through the base, and sometimes as much as 200 ft. long. The range is built with a hollow passage through the center along the ground. Lighted coal is introduced and the range becomes heated, evolving smoke and gases. When the smoke ceases to rise, the operation of coking is regarded as finished, and the surface of the range is covered with fine coal dust, which excludes the air and extinguishes the combustion. This method is much

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more wasteful than oven coking. The proportion of C. obtained from coal in Great Britain ranges from 54 to 73 per cent., so that in round numbers the better class of coal for this purpose loses a fourth of its weight. At the same time, the coal increases in volume to the extent of about one-fourth.

C. is a hard, brittle, porous solid, with a color varying from iron-gray to blackish-gray, and more or less of a metallic luster, and does not soil the fingers. It absorbs moisture from the air, sometimes to the extent of 30 per cent., and contains an amount of ash ranging from ½ up to 15 per cent. It gives off no smoke in burning.

COKE, Sir EDWARD, a distinguished English lawyer and judge, was b. at Mileham, in Norfolk, on the 1st of Feb., 1551–52. Educated at the free grammar-school of Norwich, and at Trinity college, Cambridge, he passed thence to Clifford's inn, and subsequently to the Inner Temple, to study law, and was called to the bar in April, 1578. His great ability, legal learning, and the tact he exhibited in the conduct of his cases, secured him an immense practice on the very threshold of his career. In 1586, he was appointed recorder of Norwich; in 1592, recorder of London, a position he resigned the same year for the solicitor-generalship. In the following year, he was elected member of parliament for the co. of Norfolk, and was chosen speaker of the house of commons. In 1594, he was made attorney-general, an office he continued to hold until 1606, when he was appointed chief-justice of the common pleas, the duties of which position he discharged in a manner that secured for him a great reputation. Upright and independent, with a high notion of the dignity and importance of his office, he did not, in an age of judicial sycophancy, hesitate to oppose any illegal encroachment by royalty. The court thought to win him over by making him, in 1613, chief-justice of the king's bench. But here he proved equally incorrigible, maintaining, among other things, that the king had no power to stay the proceedings in a court of justice, even when his craven-hearted colleagues begged the royal pedant's pardon on their knees for ever having entertained such an opinion. This was too much: C., in a few months (Nov., 1616), was relieved from his chief-justiceship; but in no long time after, the royal favor was in some measure again extended to him. His support of liberal measures in parliament, however, soon brought him into trouble with the court-party, and in 1621–22, he suffered seven months' imprisonment in the Tower. In the third parliament of Charles I. (1628), C. took an active part in framing the celebrated bill of rights, and it was in a great measure owing to his advocacy that the lords were induced to agree to it. C. died 3d Sept., 1634. He is now best known for his law treatise, *Coke upon Littleton, or the First Institute*, a work which is still the standard one on all questions of constitutional and municipal law in England. His other works are the *Second*, *Third*, and *Fourth Institutes; The Complete Copyholder;* and *Reading on Fines;* while his collection of law reports, which made an epoch in the history of law on their appearance, are still of great value for the profession.

COKE, THOMAS, D.D., LL.D., 1747–1814; b. Wales; first bishop of the Methodist Episcopal church. He was educated at Oxford, and entered the ministry of the established church about 1775; but objections were made to his sermons as too evangelical, and he was silenced. After an interview with Wesley he joined the new denomination and was sent to London, where he became popular. In 1782, he was appointed president of the Irish conference, and in 1784, he was made bishop of America, reaching New York in the same year. Francis Asbury acknowledged his authority, and was by him ordained a bishop. They traveled together among the various conferences until the middle of 1785, when Coke returned to England, and visited Scotland, Wales, and Ireland. He made another visit to America, and afterwards devoted himself to missionary work, his first efforts being among the negroes in the West Indies. Again he traveled in a portion of the United States, and returned to England in 1787. The next year he again visited the West Indies and the United States, and again in 1790. After Wesley's death he was chosen secretary of the general conference. The remainder of his days were passed in active missionary work in Europe and America, and in 1813 he sailed for Ceylon, dying on the voyage. He wrote a life of Wesley, a commentary on the Scriptures, *History of the West Indies; History of the Bible; Defense of the Doctrine of Justification by Faith and the Witness of the Holy Spirit*, and many essays.

COL (Fr. *neck*), in geography, is a depression or pass in a mountain-range, In those parts of the Alps where the French language prevails, the passes are usually named cols —as the Col de Balme, the Col du Géant, etc.

CO'LA NUT, or KOLA NUT, the seed—not properly a nut—of *cola acuminata* or *sterculia acuminata*, a tree of the natural order *sterculiaceæ*, a native of the tropical parts of the western coast of Africa, and cultivated in other tropical countries. There are two varieties of the tree—one with broad, and the other with narrow leaves. The natives of Guinea value the seeds very highly, believing that to take a portion of one of them before their meals, improves the flavor of whatever they may eat or drink. When sucked or chewed, cola nuts are generally asserted to render the flavor even of very putrid water agreeable; but see foot-note under TEA. They are said to possess properties analogous to Peruvian bark. They are of the size of a pigeon's egg, of a brownish color, and bitter taste. They are mentioned by almost all travelers in w. Africa.

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COL' AR'CO, in music, with the bow, in contradistinction to *pizzicato*.

COL'BERG, or KOLBERG, a fortified seaport of Prussia, in the province of Pomerania, on the Persante, near its mouth in the Baltic, in lat. 54° 9′ n., long. 15° 34′ east. It stands on a hill, surrounded with swamps, which can be readily laid under water, and is chiefly remarkable for the protracted sieges which it has undergone. In 1102, duke Boleslaus of Poland besieged it in vain. It endured long sieges in the thirty years' war, and in the seven years' war, and again in 1807, when it was most gallantly defended against the French. C. has manufactures of woolen, salt, and spirits; and salmon and lamprey fisheries. Pop. '90, 17,000.

COLBERT, a co. in n.w. Alabama, on the Tennessee river, intersected by the Memphis and Charleston railroad; pop. '90, 20,189, inc. colored. The productions are wheat, corn, oats, cotton, etc. Co. seat, Tuscumbia. Area, 556 sq.m.

COLBERT, JEAN BAPTISTE, minister of finance to Louis XIV., was b. at Rheims in 1619, and served his apprenticeship in a woolen-draper's shop. He afterwards went to Paris, where his talents introduced him to Mazarin, who soon employed him in most important affairs of state. On his death-bed, Mazarin warmly recommended C. to the king, who, in 1661, appointed him comptroller-general of finances. C., who found the finances in a ruinous condition, immediately began his reforms. Fouquet, the superintendent under Mazarin, was found guilty of impoverishing the state by his maladministration, and imprisoned for life. C. next instituted a council of finance and a chamber of justice, to call to account the farmers of the state-revenues, who were forced to yield up all the resources of the crown of which they had fraudulently possessed themselves. The debts of the state C. also reduced by arbitrary composition. So complete and thorough was the change which C. effected, that in 20 years the annual revenue had risen to 116 million livres, of which 23 were spent in collection and administration; whereas, when the management of the finances was intrusted to him, the revenue amounted only to 84 million livres, and 52 millions were absorbed in its collection. C. did not rest satisfied with being a monetary reformer, but in various ways developed the industrial activity of the nation by state support. Commerce was extended, roads and canals—including that of Languedoc—were made. He organized anew the colonies in Canada, Martinique, and St. Domingo, and founded others at Cayenne and Madagascar. Made minister of marine in 1669, he found France with a few old rotten ships; three years later, she had a fleet of 60 ships of the line, and 40 frigates. C. improved the civil code, introduced a marine code of laws, as well as the so-called *Code Noir* for the colonies; and statistical tables of the population were first made out by his orders. While attending to material interests, he did not neglect the arts and sciences; all men of learning and genius found in C. a generous patron. The academies of inscriptions, science, and architecture were founded by him. In short, C. was the patron of industry, commerce, art, science, and literature—the founder of a new epoch in France. Notwithstanding the ingenuity of C., the unbounded extravagance of his master led him to raise money in ways objectionable to his reason, and to maintain war-taxes in time of peace. He died 6th Sept., 1683, bitterly disappointed, because his great services were but ill appreciated by the king. The people, enraged at the oppressive taxes, would have torn C.'s dead body in pieces, but for the intervention of the military, and his burial by night. Because he had brains without birth, he was vexed and persecuted, both in private and public life, by those who, having birth, lacked brains.

COLBERT, JEAN BAPTISTE, 1651–90; son of the French minister of finance. He succeeded his father as the head of the navy, and by his energy raised that branch of public defense to its highest efficiency. In 1684, he personally led a naval expedition against Genoa.

COLBURN, WARREN, 1793–1833; b. Mass.; a graduate of Harvard in 1816, and teacher of a select school in Boston. His taste turned to mathematics, and in 1821 he published *First Lessons in Arithmetic*, the sale of which far exceeded that of any previous mathematical work. It was translated into nearly all the languages of Europe and into some of those of India. From teaching he went into manufacturing, and was superintendent of large operations in Waltham and Lowell; but much of his time was devoted to lecturing on scientific subjects. In 1827, he became a member of the American academy of sciences, and was for several years one of the Harvard examining committee.

COLBURN, ZERAH, 1804–40; b. Vt.; remarkable for natural gifts in mathematics. At six years of age, he was brought before the public in exhibitions, and his performances excited great interest. There seemed to be no limit to his analytical capacity. He answered almost on the instant such questions as: How many seconds in 11 years? What is the square of 999,999? and many more difficult. He was taken to England for exhibition; but the father returned in poverty, leaving Zerah at Westminster school, where he remained until 1819. The father then desired him to become an actor, and he took lessons from Charles Kemble. Failing in this, he taught school. On his father's death he returned and taught in various places. In 1825, he joined the Methodist church, and became an itinerant preacher, and in 1835, was appointed pro-

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fessor of languages in Norwich university. It is stated in his autobiography that the remarkable talent for mathematical work left him about the time he came of age.

COLBY, THOMAS, 1784–1852; an English engineer engaged in the trigonometrical survey of that country. He was a leading worker in other surveys, especially in Ireland, and became superintendent of that branch of public service. The invention of the "compensation bar" (a rod of brass and iron, the ends of which are always at the same distance without regard to temperature) is attributed to him; and he made great improvements in maps and charts.

COLBY UNIVERSITY, incorporated by the legislature of Massachusetts in 1813, as "The Maine Literary and Theological Institution." Established in 1818, at Waterville, on the Kennebec river, 18 m. above Augusta, two years later it received from the legislature of the new state of Maine the name of Waterville College." In 1867, when the college received a large endowment from Gardner Colby of Massachusetts, the name was changed to the one now used. It has an endowment of $500,000, and an annual income of about $40,000. The college is under the control of the Baptists. In 1897, Nathaniel Butler, D.D., was the president; there were 15 instructors and 211 pupils; the alumni numbered over 1100, of whom 700 were living. In the same year there were 80 students in the co-ordinate Women's College, of which Miss Mary A. Sawtelle, Ph.B., was dean. There is the usual college course of four years, and a course without Greek for the degree of Ph.B. The library had 32,000 volumes (1897). The Coburn Classical Institute, controlled by the managers of the university, has the place of a preparatory department; also Hebron Academy, Ricker Classical Institute, and Higgins Classical Institute.

COLCHAGUA, a province in Chili between the ocean and the Andes, 3516 sq. m.; pop. '00, 159,216. The climate is good and the soil fertile. There are gold and copper in the mountains. Chief town, San Fernando.

COLCHESTER, a co. in Nova Scotia around the upper part of Minas channel and Cobequid bay; 1300 sq. m.; pop. '91, 27,160. There are mines of gypsum and coal, and limestone is plentiful. The chief occupations are agriculture, lumbering, and shipbuilding. Chief town, Truro.

COL'CHESTER, a parliamentary and municipal burgh and river port, in the n.e. of Essex, on the s. bank of the Colne, 12 m. from the sea, and 51 m. n.e. of London. It stands on the sides and top of an eminence, and is well built. It has a quay for vessels of 150 tons at the suburb called Hythe. It was formerly a seat of the woolen manufactures, Flemish artisans having settled there in the reign of Elizabeth. Pop. '91, 34,559. C. returns one member to parliament. The Domesday Survey is very full and gives a complete census of the people. C. is the British *Camulodunum* and the Roman *Colonia*. The town walls, castle, and many churches and other buildings, consist of Roman brick. Great quantities of Roman remains have been found here, bushels of coins of many emperors, vases, urns, lamps, rings, bracelets, pavements, pateræ. C. was ravaged by the plague in 1348, 1360, and 1665. The ruins of the castle, built of cement-stone and Roman brick soon after the conquest, have walls 11 to 30 ft. thick.

COLCHESTER, CHARLES ABBOT, Lord, a distinguished legal and administrative reformer, was born at Abingdon, Berkshire, Oct., 1757. He was educated at Westminster school, and Christ's Church college, Oxford, and afterwards studied for the bar. Returned to parliament in 1795, he, in the very next year, succeeded in effecting an improvement in the legislation regarding temporary and expiring laws; and it is due to his exertions that municipal bodies receive a copy of all new acts as soon as they are printed. The country is mainly indebted to him for the royal record commission, the proceedings of which he for many years superintended. But the greatest service he rendered the country was in obtaining an act for taking the census of the population, the first enumeration under public authority in modern times. It was on his suggestion, too, that the private bill office, which has done much to facilitate parliamentary business, was established. In 1802, he was elected speaker of the house of commons, the duties of which high and honorable office he continued to discharge with as much impartiality as distinction, until May, 1817, when ill health compelled him to resign. He was then elevated to the peerage as baron Colchester, with a pension of £4,000 a year. He died May 29, 1829.

COLCHICIN (French, *colchicine*), a vegetable alkaloid found in *Colchicum autumnale*. It is bitter and very poisonous. See COLCHICUM.

COL'CHICUM, a genus of plants of the natural order *melanthaceæ*. The species, which are few in number, are stemless, with flowers half subterranean like the crocus, the limb of the perianth and part of tube only rising above-ground. The flowers much resemble crocus-flowers, but are readily distinguished by having six instead of three stamens, and three styles instead of one. The seed vessel does not remain to ripen under-ground, as in the crocus, but after the flowering is over, rises in the form of three little follicles slightly adhering to each other, on a lengthened stalk. The only British species is *C. autumnale*, the MEADOW SAFFRON, sometimes also, but incorrectly, named *autumn crocus*, which is plentiful in meadows and pastures in some parts of England and of the continent of Europe. It scarcely occurs as a native plant in Scotland. The flowers are pale purple; they appear in autumn, unaccompanied by any leaves; the

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leaves, which are large and broadly lanceolate, appear in spring, when the stalk which bears the ripening fruit rises amongst them. The whole plant is very acrid and poisonous, chiefly owing to the presence of an alkaloid called *colchicine* or *colchicia*. Cattle are not unfrequently injured by it in pastures where it abounds. It is, however, not difficult to extirpate, the repeated pulling of it by the hand, as it appears above-ground, being sufficient for this purpose; the roots soon become exhausted, and die. It is a valuable medicinal plant, and is much administered, in small doses, to allay the pain of gout and rheumatism. Repeated doses produce vomiting, purging, increase of the urinary secretion, and profuse perspiration. C. is generally supposed to have been the basis of the *eau medicinale*, long a celebrated empiric remedy for gout. The parts chiefly used for medicinal purposes are the corm (popularly called the root) and the seeds. The seeds are round, brown, and rather larger than mustard-seed; and fatal accidents have occurred from their poisonous nature.—Other species of C. appear to possess similar properties. The *hermodactyls* of the druggists' shops, which for many centuries have enjoyed an extensive celebrity for soothing pains in the joints, and are brought from the Levant, are believed to be the corms either of *C. variegatum* or *C. bulbocodioides;* the former of which is probably the C. of the ancients.—*C. autumnale* is not unfrequent in flower-borders. See illus., FLOWERS, vol. VI.

COL'CHIS, a province of ancient Asia, on the e. coast of the Pontus Euxinus or Black sea, situated n. of Armenia, and s. of the Caucasus. It now forms the Russian province of Imerethia, with the districts of Mingrelia and Guria. It was celebrated in the very earliest times as the native country of Medea (q.v.), and the goal of the Argonauts (q.v.), and was afterwards better known to the Greeks as the seat of some colonies of the Milesians. It was noted for its wine and fruits. The Colchians, according to Herodotus, were of Egyptian descent, being relics of the army of Sesostris, which he attempts to prove by various arguments. In the time of this historian they were subject to Persia; subsequently, they threw off their allegiance, and were ruled by kings of their own; the country then came under the dominion of Mithridates, king of Pontus; afterwards, there were princes of C. dependent on the Romans. The principal town was Dioscurias (called under the Romans Sebastopolis), and now Isgaur; the principal river the Phasis.

COLD is the term by which we signify a relative want of sensible heat. There are, therefore, no determinate boundaries between cold and heat, and it is a mere arbitrary distinction to call the degrees of the thermometer below the freezing-point, degrees of cold. When the atmosphere, or any substance which comes in contact with our body, contains less heat than the body, it absorbs heat from the body, and we call it cold. See HEAT.

The physiological action of C. on the animal organism requires a brief notice. All animals (the warm-blooded animals to the greatest extent) have a certain power of maintaining the heat of the body, in defiance of external cold, as has been shown in the article ANIMAL HEAT. This power is mainly due to a process analogous to combustion, in which carbon and hydrogen taken into the system in food, are made to unite with oxygen derived from the air by respiration. If the combustible materials are not duly furnished, or if the supply of oxygen be deficient (as in various diseased conditions), there must be a depression of temperature. Now, if the temperature of a bird or mammal (except in the case of hibernating animals) be lowered about 30° below its normal standard (which in birds ranges from 108° to 112°, and in mammals from 98° to 102°), the death of the animal is the result. The symptoms indicating that an animal or a man is suffering from a depression of the temperature of the body, are, retardation of the circulation of the blood, causing lividity of the skin, which is followed by pallor, in consequence of the blood being almost entirely driven from the surface, through the contraction of the vessels; a peculiar torpor of the muscular and nervous systems at the same time manifests itself in an indisposition to make any effort or exertion, and in intense sleepiness. The respiratory movements become slower, for physiological reasons, which will be explained in the article RESPIRATION, and the loss of heat goes on, therefore, with increasing rapidity, till the fatal limit is reached, and death supervenes.

In hibernating animals (the marmot, dormouse, bat, etc.), the power of generating heat within their own bodies is very slight, their temperature following that of the external air, so that it may be brought down nearly to the freezing-point. At this low temperature, the vital actions are scarcely perceptible, but when the temperature is again raised, the vital activity returns. The respirations (in marmots) fall from 500 to 14 in the hour, and are performed without any apparent movement of the walls of the chest; the pulse sinks from 150 to 15 beats in the minute; and the animals can with difficulty be aroused from their torpor.—For additional matter bearing upon this subject, see the articles HIBERNATION, STARVATION, and DORMANT VITALITY.

C. is one of the most powerful depressing agents, and is a fruitful cause of disease, and even of death. Thus, it is observed, that whenever the temperature of the atmosphere is suddenly reduced, and particularly when it is reduced below the freezing-point, a considerable addition takes place to the mortality of the country at large. The effects of C. are, in ordinary circumstances, most apparent among the aged and the very young, and among those suffering from chronic disease; but when a very low tempera-

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ture is long continued, even the healthy are sure to suffer, when impoverished so as not to have sufficient means of external warmth in their homes. The most direct effects of C. are in the production of what is commonly called frost-bite. The part so affected is deprived of circulation, and does not bleed on being wounded; it is marble-white or livid, and has lost all sensibility; and if the exposure is continued, or reaction is brought about too rapidly, it is apt to pass into gangrene. The extremities, especially the fingers and toes, and the tip of the nose, are the parts most liable to frost-bite. The remedy is exceedingly gradual restoration of the temperature, with gentle friction. In Russia, friction with snow is commonly resorted to, so as to secure against too rapid reaction. The effects of C. upon the general system are described by arctic voyagers, and a medical detail of them may be found in baron Larrey's interesting account of Napoleon's disastrous campaign in Russia. The circulation is much depressed; diarrhœa and rheumatic pains are frequent; in the end, the general sensibility becomes impaired, and an irresistible tendency to lie down is experienced, with excessive drowsiness. If this be not resisted, death is certain. The disease commonly termed "a cold" has been already described under CATARRH.

COLD. See CATARRH.

COLD CREAM is the term applied to a preparation of fatty substances, which is used as a mild and cooling dressing for the skin. It may be prepared by heating gently four parts of olive-oil, and one part of white wax, till a uniform liquid mass is obtained, when a little color and scent may be added; the mixture is then allowed to cool, but must be stirred the whole time, so as to prevent the concretion and consequent separation of the wax. Another variety is prepared with the addition of hogs' lard, but the latter sometimes contains common salt, and is liable to become more or less rancid. C. C. softens the skin, and tends to promote the healing of wounds and of chapped hands.

COL DE LA SEIGNE, a pass in the Alps leading from the Val d'Aosta in Piedmont into Savoy, 7 m. w.s.w. of Mont Blanc. The crown of the pass is 8472 ft. above tide.

COLDEN, CADWALLADER, 1688–1776; a native of Scotland who came to America in 1708 and practiced with great success as a physician in Philadelphia. In 1718, he settled in New York city. He was the first surveyor-general of the colony, a member of the provincial council, and in 1761 was appointed lieutenant-governor, holding the office until his death, which took place on Long Island five weeks after the British took possession of New York city. As the governors were often changed, C. was the real executive of the colony for 15 years. He published a number of works, of which the most important is his *History of the Five Indian Nations of Canada*, a work of great value. One of his favorite studies was botany, in the pursuit of which he sent many hundred plants to Linnæus, who published descriptions of them.

COLDEN, CADWALLADER DAVID, 1769–1834; grandson of Cadwallader. He was bred to the law, and became one of the most eminent of the New York bar. In the war of 1812, he was a colonel of volunteers. In 1818, he was chosen to the state assembly, and in the same year was appointed mayor of New York. He was chosen to congress in 1822, and to the state senate in 1824. C. was one of Clinton's best supporters in the work of internal improvements; and he was conspicuous in the cause of public education, the reformation of juvenile offenders, and other moral and social reforms. He wrote the life of Robert Fulton, and a memoir on the opening of the New York canals.

COLD HARBOR, BATTLES OF. See CHICKAHOMINY.

COLD PIT, or COLD FRAME, in gardening, is a simple contrivance for the preservation of half-hardy plants throughout winter, and consists of a pit, seldom more than 3 ft. in depth, and often not so much, walled or unwalled, and covered with a frame, either thatched or glazed.

COLD SPRING, a village in Putnam co., N. Y., on the Hudson river and the New York Central and Hudson River railroad, 52 m. n. of New York. The place has manufactories of iron, bamboo furniture, and pickles. It has churches, Haldane Union School and public libraries, national bank, and weekly newspaper. Pop., '90, 3000.

COLDSTREAM, a border t. in the s. of Berwickshire, on the left bank of the Tweed, 15 m. s.w. of Berwick, and on one of the main routes from Scotland to England. It is irregularly built on a high site. Pop. '91, 2000. Near C. is the famous ford of the Tweed, where the Scotch and English crossed in former times, before the erection of Berwick bridge. By this ford Edward I. entered Scotland in 1296, and near it he met the Scottish nobles, to settle the disputes of Bruce and Baliol about the crown of Scotland. By this ford also the Scottish army entered England in 1640. Here Gen. Monk, 1659–60, raised the regiment still known as the Coldstream guards (q.v.). Being a border town, C., like Gretna Green, was formerly celebrated for its clandestine marriages.

COLDSTREAM GUARDS, a regiment in the foot guards (q.v.) or household brigade, is the oldest corps in the British army except the 1st foot. Gen. Monk, in 1660, raised a corps at Coldstream, which was at first called "Monk's regiment;" but when parliament consented to give a brigade of guards to Charles II., this corps, under the name of C. G., was included in it.

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COLDWATER, a city and co. seat of Branch co. Mich., on the Coldwater river and Lake Shore and Michigan Southern railroad, 115 m. w.s.w. of Detroit; pop. '90, 5247. It is the centre of an important local trade, and has manufactures of iron, flour, oil, wood, wagons, furniture, cigars, etc., free public and state public school libraries, high school, public park, national banks, the state school for dependent and ill-treated children, and several newspapers.

COLE, a co. in Central Missouri, on the Missouri river, bounded s.e. by the Osage, intersected by the Chicago and Alton and the Missouri Pacific railroads; 390 sq. m.; pop. '90, 17,281, includ. colored. The soil is generally fertile, producing wheat, corn, oats, etc. Co. seat, Jefferson City.

COLE, THOMAS, 1801–48; b. England; came to the United States in 1819. Having a taste for painting, he persevered, without teachers, money, or encouragement, until 1825 before obtaining general recognition. In that year he set up a studio in New York in the garret of his father's house. He began to paint scenes from nature, going to the Catskills for the purpose, and very soon secured the public appreciation for which he had labored. Thenceforth his career was prosperous, and in 1829 he went to Europe. After visiting Florence, Rome, and other art centers, he returned to New York in 1832. Receiving an order to furnish a private gallery with his pictures only, he produced his "Course of Empire," five paintings which he intended to be an illustration of the history of the human race. These works are now in the gallery of the New York historical society. In later years Cole produced "Departure" and "Return," the "Dream of Arcadia," and the "Voyage of Life." The latter, an allegory in four pictures, was one of his most popular works, and elicited praise from Thorwaldsen. Among other works are: a picture of Mt. Etna, views in the White mountains, and on Lake Winnipiseogee, "L'Allegro," "Il Penseroso," "Home in the Woods," etc.

COLE'BROOKE, HENRY THOMAS, an eminent orientalist, was b. in 1765. He early went out to India, where, having served in various civil capacities under the East India company, he was appointed Sanscrit professor in the newly founded college at Fort William. Afterwards he became a judge at Mirzapore, and subsequently held the appointment of president of the board of revenue. During his residence in India, he had gained an extensive knowledge of the literature of the Vedas and their commentators, as well as of the writings of ancient Hindu grammarians, metaphysicians, and mathematicians. A sound critical judgment marks all his writings. He was a director of the Bengal Asiatic society; and many of the most valuable essays in the *Asiatic Researches* were contributed by him. These, with other papers, were afterwards republished as *Miscellaneous Essays*, in 2 vols., 1837. He also made translations from the Sanscrit works on Hindu law, algebra, arithmetic, and mensuration, which were important contributions to the history of mathematics. Among his other publications are a Sanscrit dictionary and grammar, and treatises on the philosophy and sacred books of the Hindus. He d. in London (where he had for some years been president of the Asiatic society), Mar. 10, 1837.

COLEMAN, a co. in w. Texas, on the affluents of the Colorado; 1290 sq.m.; pop. 1890, 6088. The region is adapted to cattle-raising. Co. seat, Coleman.

COLEMAN, LEIGHTON, D.D., b. Philadelphia, 1837; was graduated at the General Theological Seminary, N. Y., 1861, and held pastorates in Philadelphia, Wilmington, Del., Mauch Chunk, and Toledo, O.; elected bishop of Wis., 1875, but declined; in 1888 elected and consecrated bishop of Delaware.

COLEMAN, LYMAN, D.D., b. Conn., 1796. He traveled and studied in Europe, and has been connected with several literary institutions in the United States. In 1873, he was professor in Lafayette college. Dr. C. published *Antiquities of the Christian Church; Ancient Christianity; Historical Text-book and Atlas of Biblical Geography; Prelacy and Ritualism*, and other works. He d. 1882.

COLENSO, JOHN WILLIAM, D.D., b. England, 1814; educated at Cambridge, and was fellow and assistant tutor in St. John's college. In 1854, he was appointed first bishop of Natal, South Africa. He published a number of books on mathematics, *Village Sermons, etc.;* but the first of his works that attracted especial attention was *A Translation of the Epistle to the Romans, Commented on from a Missionary Point of View*, issued in 1861. This was followed in 1862 by *The Pentateuch and Book of Joshua Critically Examined*, in which the authorship of Moses and the accuracy of many statements in the books were questioned. An attempt was made to depose the writer by his superior, the bishop of Cape Town, but the deposition was declared void by the privy council. The local bishops then stopped his income, but the court of chancery ordered it to be paid, with arrears and interest. Previous to '70, Colenso had published *Natal Sermons*, a Zulu grammar, dictionary, and New Testament, and other educational books in that language. His later works are *The New Bible Commentary by the Bishops and Other Clergy of the Anglican Church, Critically Examined*, and *Lectures on the Pentateuch and the Moabite Stone*. He d. 1883.

COLEOP'TERA, or COLEOP'TEROUS INSECTS (Gr. *koleos*, a sheath; and *pteron*, a wing), an order of insects which, with a little change of limits and characters, has been recognized since the days of Aristotle. The number of species enumerated by naturalists, and of which examples are gathered in museums, amounts to many thousands. The C. are sometimes collectively called *beetles*, although that name is gen-

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erally more limited in its application, and many of them are known by other names, as weevils, lady-bugs, etc. The glow-worm and the blistering-fly (*cantharis*) belong to this order.

The C. may be described as four-winged insects, which have the first pair of wings converted into crustaceous wing-cases (*elytra*), and the second pair of wings folded crosswise under these when not in use. In some of them, the membranaceous wings are wanting, or rudimentary, in one or in both sexes, for there is often a difference of the sexes in this respect: more rarely, the elytra also are wanting in one sex, as in the female glow-worm. The head and antennæ vary extremely in different C., the antennæ often differ considerably in the male and female of the same species. The first segment of the thorax (*prothorax*) is greatly larger than the other two. The abdomen is united to the thorax by its whole width, and not by a stalk. C. have two composite eyes, and no additional simple or stemmatic eyes (*ocelli*). The mouth is fitted for cutting, gnawing, tearing, or chewing, but never at all for suction, and exhibits in the greatest perfection of development the complicated structure which belongs to the mouth of all the *masticating* or *mandibulated* insects. See INSECTS. The upper jaws or *mandibles* are hard and horny in most of the C., but comparatively soft in those which feed on vegetable juices, or on putrescent animal matter. The food of the C. is very various: some prey on other insects, worms, etc.; some feed on carrion; some on rotten wood—some on wood in a fresh and growing state—some on the roots of grasses and other plants—some on grain—some on leaves—some on flowers, etc. The food of their larvæ is equally various; but perfect insects and larvæ generally agree in being very voracious. Their digestive organs exhibit great diversities, according to the kinds of their food. The C. are among the insects which undergo complete transformations, and of which the pupa is inactive. The larva (grub) is generally like a short thick worm, with a scaly head and mouth, generally with six legs, of which, however, some species are destitute. Coleopterous insects are distributed over all parts of the world, but are most abundant within the tropics, where also they attain their greatest size and greatest brilliancy of colors. The splendor of the metallic tints exhibited by many of the tropical species is not excelled in nature. The order, however, contains also many species of dull hue, and sufficiently unattractive appearance. Many of the C. are noted for the mischief which they do to crops, stores of provisions, timber, and articles of furniture, trees, etc.; few of them are of any immediate use to man, the principal of these being the blistering-flies or cantharides. See illus., BEETLES, vol. II.; INSECTS, vol. VIII.

COLERAINE', a parliamentary and municipal borough and seaport, in the co. of Londonderry, Ireland. It is situated chiefly on the right bank of the Bann, 4 m. from the sea, and 47 m. n.n.w. of Belfast, with which it is connected by railway. It consists of a central square and several diverging streets. Pop. '91, 6800.

COLERIDGE, HARTLEY, the eldest son of Samuel Taylor Coleridge, was b. at Clevedon, near Bristol, on the 19th Sept., 1796. In 1815, C. was entered a scholar of Merton college, Oxford. At the university, he became the slave of intemperate habits, and after obtaining the Oriel fellowship in 1818, he was judged to have forfeited it by the authorities. He then went to London, wrote for the *London Magazine*, and published therein some sonnets of remarkable beauty. He afterwards repaired to Ambleside, to receive pupils, but the scheme failed. Near this little town, so associated with genius, he resided till his death in 1849. He inherited much of his father's genius, and all his weakness of will. He wrote good verses and better prose. As a writer of verse, he is best known by his sonnets, some of which are surpassed only by those of Milton and Wordsworth. His most important prose works are the *Worthies of Yorkshire and Lancashire*, and the *Life of Massinger*.

COLERIDGE, HENRY NELSON, 1800–43; nephew of the English poet, and graduate of Cambridge, devoted to letters, an associate of Macaulay, Praed, and others in writing for *Knight's Quarterly Magazine*, where he appeared over the signature of Joseph Haller. In 1825, he published *Six Months in the West Indies*. The next year he was called to the bar, and about that time married his cousin, the poet's daughter. His most important literary work was done as his uncle's executor in publishing the *Table Talk; Literary Remains;* and *Confessions of an Inquiring Spirit*.

COLERIDGE, JOHN DUKE, Baron, b. 1821; son of Sir John Taylor Coleridge. He graduated at Oxford, 1842; was called to the bar, 1846; and soon became the leader of the western Circuit. He was created Q. C. in 1861; sat in the house of commons for Exeter, 1865–73; was knighted, 1868; appointed chief-justice of the court of common pleas, 1873, Nov. 19; and in the following month was raised to the peerage. On the death of Sir Alexander Cockburn, 1880, he succeeded him as Lord Chief Justice of England. In 1883 he visited the U. S., and was cordially received, especially by the bench and bar. He died June 14, 1894.

COLERIDGE, SIR JOHN TAYLOR, D.C.L., b. 1790; a nephew of the poet, and member of the English bar. In 1835, he was made a judge of the king's bench, and a privy councilor in 1858. On the retirement of Gifford in 1824, he became for a short period editor of the *Quarterly Review*. He published an annotated edition of Blackstone's *Commentaries*, and a Memoir of the Rev. John Keble, 1869. He d. 1876.

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COLE'RIDGE, SAMUEL TAYLOR, was b. at Ottery St. Mary, in the county of Devon, of which parish his father was vicar, on the 21st Oct., 1772. He was educated at Christ's hospital, and numbered Charles Lamb among his school-fellows. His acquirements in Greek were extensive; and before his 15th year he plunged boldly into the sea of metaphysics, and swam therein until the day of his death. His industry, if desultory, was great; he read whole libraries. Full of book-knowledge, and without ambition or any practical bent, he was on the point of apprenticing himself to a shoemaker, when his head-master interfered, and rescued to literature and thought his most distinguished scholar. A copy of Mr. Bowles' sonnets falling into his hands at this time, attracted him towards poetry, in which for a time he found rest.

In 1791, C. entered Jesus college, Cambridge. At the university, he displayed no mathematical aptitude; his whole mind was given to classics, and he obtained a prize for a Greek ode. He did not take a degree. During the second year of his residence at the university, in a fit of despondency, occasioned by an unsuccessful love matter, he quitted Cambridge for London, and enlisted in the 15th dragoons, under the assumed name of Comberbach. He never advanced beyond the awkward squad, and he enjoyed to the close the reputation of being the worst rider in the corps. One of the officers luckily discovered his classical acquirements, and, becoming acquainted with his real history, communicated with his friends, and C. effected his discharge.

On his release, the poet proceeded to Bristol, and, making the acquaintance of certain poetic enthusiasts—Southey was of the number—whose minds were somewhat unsettled by the revolutionary movement in France, he formed a scheme to emigrate to the banks of the Susquehanna, in North America, and there, in pastoral peace and plenty, to bring back the golden age to man. C. found, to his surprise, that before Paradise could be thus regained, money was indispensable; and as of *that* both he and his friends were absolutely devoid, the dream of "Pantisocracy" had to be given up. About this time, Joseph Cottle, bookseller in Bristol, paid C. 30 guineas for a volume of poems, and, after many delays and the advancement of additional sums, the volume was published. In 1795, he married Miss Fricker—his friend Southey on the same day wedding another sister—and removed to Nether Stowey, a village in Somersetshire, in which neighborhood Wordsworth was then staying. It was here, surrounded with beautiful scenery, and in daily communication with the graver and intenser spirit of his friend, that C.'s principal poems were composed. Here he wrote the *Ancient Mariner*, and the first part of *Christabel*, the music of which took captive Scott and Byron, and which was imitated by both with no remarkable success. At this time, C. was in theology a Unitarian, and preached frequently to congregations of that religious sect. In 1798, he visited Germany, and studied at Göttingen. On his return to England, he went to reside at the lakes, where Wordsworth and Southey then lived; and then it was that the nickname "lake poets" was applied by the opposition reviews to the trio of friends—a nickname which has long since ceased to be a reproach. In the year in which C. went to live in Cumberland, he published his noble translation of Schiller's *Wallenstein*. Having formed a connection with the *Morning Post*, he contributed to its columns articles on politics and literature. In 1804, he was at Malta, acting as secretary to the governor, sir Alexander Ball, an appointment he held nearly a year and a half. In 1808, he delivered lectures on poetry and the fine arts at the Royal Institution, London; and the year after, he commenced the publication of *The Friend*, a serial which did not find much commercial success. By this time, C. had written, if he had not published, his finest poems; and imprudent, without resolution or strong sense of duty, and with a taste for German metaphysics and opium gradually taking possession of him, he left his wife and family with Southey, and went to London, where he resided first with Mr. Basil Montague, and afterwards, and up till the period of his death, with Mr. Gillman at Highgate. Here the rays of his splendid genius shone more and more fitfully through clouds of German metaphysics, and his mental and moral fiber became more and more debilitated by opium. He meditated many theological and philosophical works, which were to "reduce all knowledge into harmony," and many epic poems which were to be the glory of literature, and never progressed so far as the first sentence of either. With the subsidence of the writing faculty, the talking faculty developed itself in C. after a fashion unknown to ancient or modern times. At Mr. Gillman's house, he held weekly *conversazioni*, discoursing on every subject human and divine for hours; and thither, from all parts of the country, ardent young men came rushing to listen to the wisdom of the sage, in "linked sweetness" exceedingly "long drawn out." Towards the close of his life, his religious opinions underwent a change, and he became a believer in the trinity. All intellectual pride had ceased, and the most childlike humility had taken its place. He seemed to be conscious that the greatest powers which for generations had been granted to any Englishman had been by him miserably wasted. He died at Highgate on the 25th July, 1834, in his 62d year.

As an intellectual power, C. manifested himself in a great variety of ways. Compared with his contemporaries, he did not produce a very large amount of original poetry; and of what he did produce, a considerable portion is prosaic and artificial, but the residue is of the highest order of merit. No poet ever evolved such exquisite fantasies, or wove our language into such webs of spiritual melody. He is also to this day the greatest of philosophical critics. He was the first who gave a definite reason for the

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"faith that is in us" regarding Shakespeare. He was the first representative of German literature and philosophy in England, and, till Carlyle came, the most potent. His own philosophical and theological writings, although, from constitutional indolence and irresolution, in some measure incomplete, are full of incidental merits, and have given a new impulse to English thought; yet it is right to mention here, that in his philosophical writings he has been convicted of the most extraordinary plagiarism. Prof. Ferrier, in *Blackwood's Magazine*, April, 1840, "tracked the footsteps of this literary reaver through the Hercynian brakes" of Schelling's metaphysics (see also Hamilton's Reid, note), and has shown page after page to be pilfered from the German author. It has been argued, however, by way of explanation and palliation, that C., who certainly did not lack original and penetrating powers as a metaphysician, was, from the sluggishness and irresolution of his mind, better fitted to conceive in outline, and then adapt from others in detail, than to elaborate for himself a system of thought, or even the fragment of a system; while his notoriously confused and dreamy memory would be apt to mingle and confound what was his own with what *might have been* such. A complete edition of his *Poetical and Dramatic Works, with Memoir*, was issued in 1877, and an exhaustive biography was begun in 1888 by his grandson, Mr. Ernest Coleridge. See also the *Life* by Gilman (1834); and by Traill (1884); De Quincy, "S. T. Coleridge," in his *Recollections of the Lakes* (1857); Charles Lamb, *Letters* (1888).

COLERIDGE, SARA, 1802–52; only daughter of the poet, and wife of her cousin, Henry Nelson Coleridge, whom she married in 1829. One of her first publications *Pretty Lessons for Little Children*, designed for her own children, became a popular household book. She assisted her husband in editing her father's works, and when the husband died, assumed the whole responsibility herself. She edited *Notes on Shakespeare; Aids to Reflection;* and *Essays on His Own Times*. In 1837, she published *Phantasmion, a Fairy Tale*. In her later years she was a confirmed invalid.

COLES, a co. in s.e. Illinois, watered by Embarras river, and intersected by the Cleveland, Cincinnati, Chicago, and St. Louis, the Toledo, St. Louis and Kansas City, and the Louisville, Nashville, and St. Louis railroads; 520 sq. m.; pop. '90, 30,093. The surface is prairie and forest, with fertile soil. Chief productions, wheat, oats, corn, butter, wool, and sorghum molasses. Co. seat, Charleston.

COLE'SEED. See RAPE.

COLET, JOHN, 1466–1519; an English theologian who studied in Paris and Italy, and became acquainted with Budæus and Erasmus. Returning to England he filled several offices in the church, ending with dean of St. Paul's. He founded St. Paul's school in London, of which William Lilly was the first master. His religious opinions were so much more liberal than was common at the time that he was subjected to considerable persecution. As dean of St. Paul's, he introduced the practice of preaching from and expounding the Bible; and though he remained in communion with the church of Rome, he disapproved of auricular confession and the celibacy of the clergy. His influence is traceable as paving the way for the reformation.

COLET, LOUISE REVOIL, 1810–76; a French poetess and novelist, wife of a musical professor in the Paris conservatory. Her first work, *Fleurs du Midi*, gained her the friendship of Cousin, but it was so severely criticised by Alphonse Karr that the authoress undertook to stab him with a knife. In 1839, she published *Penserosa*, a second volume of verse; and this was followed by *Le Musée de Versailles*, a poem for which she was crowned by the institute; *La Jeunesse de Goethe*, a comedy; and *Les Cœurs Brisés*, a novel. In 1840, she published *Les Funerailles de Napoléon*, a poem, and *La Jeunesse de Mirabeau*, a novel. In 1849, she was sued by the heirs of Madame Recamier for publishing that famous woman's correspondence with Benjamin Constant. She was crowned five or six times by the institute, more through the influence of Cousin than from the merit of her works. She wrote many stories, plays, didactic poems, and travels, but they show no remarkable talent.

COLE'WORT, a name given to some of the many cultivated varieties of *brassica oleracea*, and applied, like the names borecole and kale, to varieties differing from the cabbage (q.v.) in their open heads of leaves, which are used as greens, especially in the winter months. The same name is also given to cabbages cut for use before their leaves have fully closed into heads; and the common kinds of cabbage are often planted pretty close together, in order to be used in this way, for a supply of greens in winter and spring. C. or *collet*, is said to have been originally a name of the wild plant from which all the cultivated varieties are derived.

COLFAX, a co. in e. Nebraska, bounded s. by Platte river; intersected by the Union Pacific and the Burlington Route railroads; 400 sq. m.; pop. '90, 10,453. Agriculture is the main business. Co. seat, Schuyler.

COLFAX, a co. in n.e. New Mexico, bounded on the n. by Colorado; area, 6600 sq. m.; pop. '90, 7974. Co. seat, Raton.

COLFAX, SCHUYLER, b. New York, 1823. He went to Indiana in 1836, where he studied law, and in 1845 became editor of the *Register*, a whig newspaper at South Bend. He was elected to Congress in 1854, and was six times re-elected, being speaker of the

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house in 1863. In 1868 he was nominated for vice-president and elected. After the expiration of his term, Mar. 4, 1873, he was not prominently in public life. D. 1885.

COLGATE UNIVERSITY, at Hamilton, Madison co. N. Y., a Baptist institution, was founded as a seminary in 1820; reorganized into an academy, college, and theological seminary in 1832, and chartered as Madison University in 1846. In recognition of liberal gifts from the Colgate family, its name was changed in 1890 to Colgate University. Its endowment is (1897) more than $1,500,000. Other property, in grounds, buildings, and appliances, is valued at $400,000 more. West college, 100 × 60 ft., and East college, 100 × 56 ft., are mainly used for students' rooms. Alumni Hall, 100 × 73 ft., contains most of the lecture rooms, the college chapel, and a large audience room for college commencements. The Library building is a handsome fire-proof structure costing $140,000. The library numbers 20,000 volumes. It has a special collection of more than 25,000 reports and documents illustrating the history of the Baptist denomination. There is a well-equipped chemical laboratory, an excellent natural history collection, and ample apparatus for instruction in physics. The university awards $500 a year in prizes, and pays of itself $4500 annually to students on scholarships, and over $5000 more through the Education Society. The site of the university is one of great beauty, being elevated about 60 ft. above the waters of the Chenango, and overlooking the village of Hamilton. Its grounds afford a fine college campus for athletics. In connection with the academy and Theological Seminary, there is an area of 200 acres. Number of instructors in '96–'97, 36; students in college, 166; in theological seminary, 50; president, George William Smith.

COLIBRI. See HUMMING-BIRD.

COLIC (from *colon*—see ALIMENTARY CANAL), a name employed by the later Greek and the Roman physicians to denote diseases attended with severe pain and flatulent distension of the abdomen, without diarrhea or looseness of the bowels. The disease (commonly called *gripes* or *belly-ache*) is now generally believed to be spasmodic in character, and to be dependent upon irregular contractions of the muscular coat of the intestines: its supposed particular connection with the colon, or large intestine, however, is not usually to be made out from the symptoms. Painful disorders of the bowels are very frequent in persons who are not attentive to the regular evacuations, especially when they are exposed to cold so as to experience chill or coldness of the feet, which will often suffice to bring on an attack of colic. The disease is usually attended with constipation (q.v.), and ceases when the regular action of the bowels is restored, although often in this case the operation of medicine is attended by continued pain for a time. Warm fomentations to the abdomen may be employed with advantage, sometimes medicated with opium, or decoction of poppy-heads; and great relief is commonly experienced from friction with a warm liniment, such as opodeldoc, or the soap and opium liniment. Warmth to the feet, and the recumbent posture, are also to be recommended. In very severe or protracted cases, opium may be taken internally. A good remedy in such cases is a full dose of castor-oil (one oz. or more for an adult), with 30 or 35 drops of laudanum, or of solution of morphia. (Opiates should not be given to children except under medical advice, and in very reduced doses.) When C. resists such mild and simple remedies as the above—when it is accompanied by tenderness of the belly, or by hard swelling in any part of it—when constipation is obstinate, or vomiting is present—when there is feverishness, or tendency to exhaustion—or when there is reason to believe that it may depend on any other cause than the mere accumulation of the products of digestion in the intestines, no time should be lost in seeking the best medical assistance that can be procured; for C. is closely allied as a symptom to several very severe and dangerous diseases. One of these complicated forms of C. is termed ileus (Gr. *eileon*, from the idea that its seat was in the small intestine, *ileum*). It is attended with obstruction of the bowels, often from mechanical twisting or involution of one part with another (hence termed *volvulus*). This is, of course, a disease of extreme danger. The only treatment that can be attempted without medical assistance, is the employment of large injections by the lower bowel, and opium in moderate and repeated doses (¼ grain to 1 grain, or 12 to 20 drops of laudanum) by the mouth, carefully watched, and discontinued if there is any sign of narcotism. See OPIUM.

COLIGNY, GASPARD DE, a French admiral and gen. of eminence, was b. at Châtillon-sur-Loing, Feb. 16, 1517. Introduced at court, he served under Francis I. in Italy, where he evinced great bravery. Under Henry II., he was made an infantry col., and in 1552, admiral of France. On the death of Henry II., C., who had previously adopted the reformed faith, became, with the prince of Condé, one of the great leaders of the Huguenots. In this capacity he was remarkable alike for his prudence and his bravery. He had the intelligence to plan, as well as the daring to execute, and above all, a heart that was not to be cast down by disasters. At the battles of Dreux and Jarnac, in the former of which Condé was taken prisoner, and in the latter killed, C.'s skill saved the remains of the Protestant army. When peace was concluded in 1570, C. went to court, and was apparently well received by the king (Charles IX.); but the enmity of the Guises, by whom C. was unjustly accused of murdering the duke of Guise at the siege of Orleans, was stirred up against him, and an attempt was made by one of their menials to assassinate him on the street, Aug. 22, 1572. This attempt at individual murder was but a preliminary to the general massacre of Huguenots which took place two days afterwards, and in which C. was basely slaughtered, his body being afterwards exposed to the vile outrages of the mob.

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COLI'MA, a name of various application in Mexico.—1. A volcano of the Cordilleras with an elevation of about 12,000 ft., in lat. 20° n., and not far from the western coast of the republic.—2. A territory of the confederation, with (1889) 69,547 inhabitants, extending about 100 m. along the coast; area about 3,400 sq. miles.—3. The capital of the territory, comprising nearly the half of its population, stands in a fertile plain to the s.w. of the volcano.—4. A seaport on the Pacific, about 40 m. to the s.w. of the capital.

COL'IN. See VIRGINIAN QUAIL.

COLISEUM. See AMPHITHEATRE.

COLL, one of the western isles of Scotland, off the w. coast of Mull, and forming part of Argyleshire, and 2½ m. n.e. of Tiree isle. It is 14 m. long from n.e. to s.w., with an average breadth of 2½ miles. More than a third of it is cultivated, or in pasture. The isle is low and rocky, and composed of gneiss, approaching to granite and hornblende slate. Pop. 643, engaged in agriculture and fishing.

COLLABORATION. The united labor of two or more persons on a literary production, as in the arrangement of a drama, or the compilation of a book requiring knowledge from different sources. Thus, Charles Reade and Dion Boucicault wrote *Foul Play;* Charles Dudley Warner and Mark Twain, *The Gilded Age;* Henry C. De Mille and David Belasco, *The Wife* and *The Charity Ball.* Walter Besant and James Rice also long worked in collaboration upon numerous novels. The collaboration of Messrs. Erckmann and Chatrian (q.v.), in French, produced many delightful works.

COLLAMER, JACOB, LL.D., 1792–1865; b. N. Y., but removed when young to Vermont, graduating at the university of that state in 1810. He was admitted to the bar in 1812, and soon became one of the leading lawyers of the state. He was associate justice of the supreme court from 1833 to 1841. In 1842, he was chosen a member of congress, and twice re-elected. He was postmaster general in Taylor's cabinet for a year; and in 1850, was elected judge of the supreme court of the state. In 1856, he was elected to the U. S. senate, where he served until his death.

COLLAR-BEAM, STRAINING-BEAM, etc., the horizontal tie connecting a pair of rafters. Large roofs have two or more collar-beams.

COLLAR-BONE. See CLAVICLE.

COLLARING, the cylindrical part of the capital in the Doric and Tuscan orders. It is often termed the neck.

COLLAT'ERAL (Lat. *collateralis*). See CONSANGUINITY, SUCCESSION.

COLLATERAL SECURITY is an additional and separate security for the performance of an obligation, or the implement of a bond or covenant.

COLLA'TION, in the law of England, is where a portion advanced by the father to a son or daughter is brought into *hotch-pot*, in order that the beneficiary may have an equal share of his personal estate at his death. C. in this sense corresponds to the C. amongst younger children in Scotland.

COLLATION OF MANUSCRIPTS. See TEXTUAL CRITICISM.

COL'LE, a t. of Italy, situated on the Elsa, about 23 m. s.s.w. of Florence. A steep ridge separates the town into two portions, the lower of which is chiefly occupied by manufactories. C. has a cathedral and castle, and its paper-manufacture is extensive. Wine, olive-oil, and silk are produced in the environs. Pop. 8,000.

COLLECT, a name of uncertain origin, given to certain short prayers in different church liturgies. It is from the Latin *colligere*, as some ritualists think, because of the comprehensive brevity of such prayers, the matter of the epistle and gospel, e.g., being gathered up, or *collected*, into the C. for the day, as appears in the English Common Prayer Book. Others, with more probability, ascribe to the name an origin from an ancient practice of the chief minister collecting into a single brief prayer at the end of the service the previous devotions of the people; accordingly, one of the service-books of the ancient Catholic church was called *Collectarium*, as containing such prayers. Of the collects used in the liturgy of the church of England, some are taken from the old Roman missal, and were probably the composition of St. Jerome; others are of more ancient and primitive times, and a few were composed at the reformation. They begin with commemorating some attribute of God, or pleading some infirmity or necessity of man, and end with a simple petition based thereupon. Hence it will be seen that the practical teaching of a church may to a great extent be seen in its collects. For every Sunday there is a proper C., with corresponding epistle and gospel; and this C. stands for every day in the following week, except in the case of festivals and their eves or vigils, which have collects of their own.

COLLECTANEA, the name given to literary collections of any description, as, for instance, sayings of noted men, aphorisms, jests, miscellaneous anthologies, and chrestomathies.

COLLECTIVISM, a word of recent origin, applied to the doctrine that property instead of being owned and controlled by individuals, should belong jointly to the community or other form of social organization. The exact meaning must depend upon the form of socialism with which it is connected. See SOCIALISM.

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COLLEGE (Lat. *collegium*, a collection or assemblage). In its Roman signification, a C. signified any association of persons for a specific purpose. In many respects it was synonymous with *corpus*, a body or collection of members, a corporation—with *universitas*, a whole as contrasted with its parts—and with *societas*, a company or partnership, as opposed to all the members of which it was composed. A Roman C. had a common chest, and it could sue and be sued in the name of its manager (actor or syndicus), just like an incorporation with It required also to be incorporated by some sort of public authority, springing either from the senate or the emperor. A C. could not consist of fewer than three persons, according to the well-known maxim, "three make a college" (Dig. 50, tit. 16, l. 85). Some of these colleges were for purely mercantile purposes, but there were others which had religious objects in view, such as the *collegia pontificum, augurum*, etc., and which thus made a sort of approach to a C. in the modern sense. With us, a C. is an incorporation, company, or society of persons, joined together generally for literary or scientific purposes, and frequently possessing peculiar or exclusive privileges. See PHYSICIANS, COLLEGES OF; SURGEONS, COLLEGES OF. Very often in England a C. is an endowed institution connected with a university, having for its object the promotion of learning. In this relation, a C. is a sub-corporation, i.e., a member of the body known as the university. The constitution of a C. in this, its most general and proper sense, depends wholly on the will of the founder, and on the regulations which may be imposed by the visitor whom he has appointed. For a more detailed account of C. in this sense, see UNIVERSITY, and the names of various colleges and universities given below. In Scotland and in America, the distinction between the C. as the member, and the university as the body, has been lost sight of; and we consequently hear of the one and the other indiscriminately granting degrees, a function which in the English and in the original European view of the matter belonged exclusively to the university. Where there is but one C. in a university, as in the case in all the universities of Scotland, the two bodies are of course identical, though the functions which they perform are different. In Germany, there are no colleges in the English sense; and though the universities in that country perform precisely the same functions as in Scotland, the verbal confusion between the C. and the university is avoided by the latter performing the functions of both in its own name, as two separate parts of its proper duties. In France C. has a meaning totally different from that which we attach to it: it is a school, corresponding, however, more to the gymnasium (q.v.) of Germany than to the grammar school of this country. All the colleges are placed under the University of France, to which the centralizing tendencies of that country have given a meaning which also differs widely from that which the term university bears in England. See also CAMBRIDGE UNIVERSITY; CO-EDUCATION; COLLEGES, AMERICAN; COLLEGIATE EDUCATION FOR WOMEN; DEGREE; DUBLIN UNIVERSITY; EDINBURGH UNIVERSITY; HARVARD UNIVERSITY; OXFORD UNIVERSITY; UNIVERSITY; YALE UNIVERSITY; and the names of individual colleges, universities, and other higher institutions.

COLLÈGE DE FRANCE. This very important institution was founded by Francis I., in 1530, and, although originally intended as a college of three languages only, it is now celebrated for its educational advantages in history, science, and literature. It has no connection with the University of France (q.v.), and, being supported by the government, is directly under the control of the minister of public instruction. The college has a literary and a scientific faculty, and each has about twenty professors. It is specially designed to attract pupils older than the ordinary university students, and, like the Sorbonne (q.v.) lectures, the instruction is gratuitous. Such distinguished men as M. Renan, M. Laboulaye, M. Gaston de Paris, and M. Brown-Séquard have been numbered among its professors.

COLLEGE OF ELECTORS. See ELECTORAL COLLEGE.

COLLEGE OF HERALDS. See HERALDS' COLLEGE.

COLLEGE POINT, a village in Queens co. N. Y., on Long Island sound, and a branch of the Long Island railroad, 11 m. e. of New York; pop. '90, 6127. There are several manufactories, one very large establishment making india rubber goods, free institute of technology, library, bank, kindergarten, electric light, water, and sewerage plants, and several churches, schools, and periodicals.

COLLEGES, AMERICAN, have been organized mostly according to one general plan. A corporation, acting under a charter granted by the legislature, has control of the property, appoints the instructors, makes laws for the government of the institution, and confers degrees. In some colleges, the trustees fill the vacancies which occur in their body; in others, the state appoints some or all of the board; and in an increasing number, the alumni elect a certain part. In this country, the distinction between a college and a university has never been sharply drawn. Some of the youngest and smallest institutions call themselves universities, and some of the oldest have out-grown the condition of the college, assuming the name of the university. See UNIVERSITY.

As a large number of American colleges were established with special reference to the training of young men for the Christian ministry, the course of study was naturally arranged in accordance with that design. A century ago the studies chiefly pursued were

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Latin, Greek, mathematics in limited measure, and, in larger proportion, logic, metaphysics, rhetoric, and oratory. Theology received special attention during the latter part of the course. Towards the close of the last century, natural philosophy and astronomy began to be more thoroughly studied. Modern languages and physical and political science had hardly an assured place in the course until after the present century began. Towards the middle of the century, there was manifest an increasing dissatisfaction with the restricted course. Formerly there had been three distinctively marked professions—theology, medicine, and law; but as new employments were developed, having the dignity and responsibility of professions, modifications in preparatory studies became necessary. To secure them, various methods were proposed. Some persons demanded that the course of study in existing colleges should be changed by dropping certain studies, so making room for those with new and higher claims; others desired that new studies should be added to the old or that parallel courses should be established with liberty of choice between them; a third class believed that new institutions were required for the new studies. Much has been accomplished in all these directions except the first. No previously established college has abandoned the old course, and it is not probable that any one will. But very many have added to the old course elective studies which are submitted to the student's choice. Parallel courses, also, have been established. The old method aims first at securing mental development, culture, and discipline, which may afterwards be applied to the chosen course of life. The new makes immediate preparation for that course its first aim, and is satisfied to have mental discipline and culture as the incidental yet the assured result of the studies pursued. In most of the new institutions of the west, there are several courses of study, among which students are allowed their choice. The older colleges of the east, even the oldest, are impelled to follow in the same path. They have all, for some time past, given a limited range of elective studies during the latter half of the course. In 1869, Harvard extended the liberty of choice through three out of the four years. The movement has reached beyond the Atlantic, even the university of Oxford, where the supremacy which Latin and Greek had maintained for centuries has been broken. In 1872, the statutes were amended so as to include mathematics, natural science, natural history, jurisprudence, and theology, among the subjects in which candidates for degrees may be examined, and to allow a wide range both in subjects and authors, on which the examination may be passed. The latitude of choice is even greater than in most American colleges. See Elective Studies.

Besides elective courses in a college, separate colleges have been established exclusively for scientific and practical studies. Some of these are departments of existing colleges, e.g., the scientific schools in Yale, Columbia, Princeton, and Lafayette colleges; and some are independent, e.g., the institute of technology, in Boston, and the Stevens institute at Hoboken, and the agricultural and industrial colleges endowed under the congressional grants of 1862. These changes are partly the result and partly the cause of the great development of physical science which marks the present generation. The science of matter, as distinct from the science of man and of mind, now importunately demands a high place in public regard. Yet the old science cannot be driven out. It has a sphere into which nothing can intrude. The greater the increase of material knowledge, the more will mental and spiritual attainments ultimately be required. The wisest friends of metaphysical study, therefore, view with no disfavor the splendid augmentation of facilities for physical investigation.

Examinations at college, when designed as tests of comparative scholarship, are now, from the beginning of the course to the end, conducted in writing and by means of questions furnished alike to the whole class and at the same time. This method commends itself by its fairness to every mind; yet "examination papers" are scarcely more than one generation old. See Co-education, Collegiate Education for Women.

COLLEGIANTS, a sect in Holland who called their assemblies colleges. They rejected creeds, had no regular ministry, nor any form of church government. They adopted baptism by immersion, but their communion was open to all. They were not unlike the Plymouth Brethren of the present day.

COLLEGIATE CHURCHES—so called from having a college or chapter, consisting of a dean and canons, attached to them—differ from cathedrals in that the see of the bishop is at the latter. The service is or should be the same in both. They are under the jurisdiction of the bishop of the diocese in which they are situated, and he exercises visitorial powers over them. Those remaining in England are Westminster, Windsor, Wolverhampton, Heytesbury, Southwell, Middleham; also Brecon in Wales, and Galway in Ireland. Ripon and Manchester have been constituted the cathedrals of the new dioceses. See Reformed Church, The Collegiate Dutch.

COLLEGIATE EDUCATION FOR WOMEN. This, as a system, originated in the United States, and its progress has been more rapid in this country than elsewhere, although the belief that a superficial and mainly ornamental education was all that a young lady required to supplement the instruction received in the common school, was well-nigh universal until the opening of the nineteenth century. The first person to advocate a more enlightened course was Mrs. Emma Hart Willard (q.v.), who, as the head of a young ladies' seminary at Middlebury, Vt., in proximity to a college for men, had been made to feel strongly the disparity between the sexes in educational facilities.

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In 1817 she presented to President Monroe, a plan for instituting public seminaries for girls, under the supervision of public men, and in 1818 laid it before Governor Clinton, of New York, who indorsed it, and recommended an appropriation by the legislature of that state. In 1819 Mrs. Willard published *A Plan for Improving Female Education*, and having removed her seminary to Waterford, New York, succeeded in getting it incorporated by the legislature, which also passed an act giving to academies for girls a share in the literature fund. Her plan contemplated a library, a laboratory, philosophical apparatus, a large staff of teachers, a board of trustees, and to this end an endowment, which the legislature refused, and in 1821 she removed her seminary to Troy, N. Y., where it attained a national fame for its extended course of instruction, although it was not an endowed institution, nor did it grant diplomas. In 1819 a seminary was opened at Byfield, Mass., by Rev. Joseph Emerson, formerly a tutor at Harvard, who believed in educating young ladies on the same principle as young men. in which such "advanced" studies as astronomy and natural philosophy were pursued, and one of his pupils and teachers, Miss Zilpah P. Grant was in 1824 called to become the first preceptress of Adams' Female Academy, at Derry, N. H. Founded and endowed by Jacob Adams in 1822, and incorporated the same year, this institution was the first to provide a systematic and thorough course of English study, to make entrance into its grades dependent upon examinations, and to confer what are now called diplomas at the completion of the course, which at Derry was three years in length. In 1824, six young ladies received these certificates. In 1828 Miss Grant became the principal of a seminary at Ipswich, Mass., associating with her her fellow pupil at Byfield and assistant at Derry, Mary Lyon (q.v.), broadening the course of instruction followed at Derry, and almost succeeding in obtaining an endowment. In 1832 Miss Grant and Miss Lyon appealed to the public to aid them in establishing a permanent school for teachers, and although their plans were once more frustrated, they were eventually realized by the opening in 1837 of Mount Holyoke Seminary (q.v.), at South Hadley, Mass., the foundation and frame-work of which were Miss Grant's, and the establishment of which was due mainly to the energy of Miss Lyon.

In 1827 a seminary affording advanced instruction for girls was opened at Hartford, Conn., by Miss Catherine E. Beecher (q.v.), who had become convinced, perhaps independently, of the unfairness of limiting higher education to one sex, and in 1829, that lady published a pamphlet, *Suggestions Respecting Improvements in Education*, which was widely circulated and had great influence. In this she advocated as Mrs. Willard and Miss Grant had done, such an endowment of seminaries for women as should secure the stability and peculiar advantages enjoyed by colleges for men. In 1836 Georgia Female College, at Macon (now Wesleyan Female College), was chartered with full collegiate powers, and in 1839 that institution was opened with a four years' course, conferring its first diploma in that year. Monticello Female Seminary, at Godfrey, Ill., opened in 1838, was the result of a careful study of the seminaries at Ipswich, Troy, and Mt. Holyoke. Its teachers sustained to their departments and to the institution relations similar to those of professors in men's colleges; many of its text-books were those used at Yale and Amherst, and in other respects it possessed at the beginning more of the college essentials than any seminary for women west of the Alleghanies. Oberlin College, founded in 1834, without restrictions as to sex, granted a diploma to a woman in 1838 and in 1841 conferred degrees upon three women.

There are at present, in the United States, more than 200 institutions for the superior instruction of women, fully one-half of which bear the title of "college," but these provide general instruction, while essentially collegiate work is done by a smaller group of institutions whose admission requirements, standards of instruction, and general organization, accord with those that have long been characteristic of colleges of liberal arts. The oldest of these, Elmira College, Elmira, N. Y., incorporated in 1855, had from the beginning a four years' course, and in 1859 graduated a class which had received the usual college training of that time, including two years' study of Latin and Greek. Ingham University, at Le Roy, N. Y., organized as a seminary in 1837, was chartered as a university in 1857. Vassar College (q.v.), at Poughkeepsie, N. Y., chartered in 1861 and organized in 1865, attracted wide attention by reason of its large endowment, and had for its first lady principal, a former pupil of Miss Grant, at Ipswich. Wells College, Aurora, N. Y., chartered in 1868 as Wells Seminary, took the name Wells College about 1870. Wellesley College, Wellesley, Mass., giving a five years' course, was chartered in 1870 and opened in 1875; Smith College, Northampton, Mass., chartered in 1871, was opened in 1875; Bryn Mawr, Bryn Mawr, Pa., chartered in 1880, was opened in 1885. The last-named does not confer degrees but awards annual scholarships. The first medical college for women, in this country, was opened in Boston in 1850, and the next were those established in New York city in 1861 and 1868.

The opening to women of men's colleges has been described in the article CO-EDUCATION. In several places where such a system of education has not been favored, affiliated institutions have been established, separate from the college proper, but enjoying the instruction of its professors. The first of these was the Society for the Collegiate Education of Women, better known as the Harvard Annex, organized at Cambridge, Mass., in 1879 and chartered in 1882. Those of its students who have pursued the classical course of four years receive a certificate equivalent to the degree of B.A. in Harvard. From 1885 to 1889 Columbia College, New York, granted the degree of B.A. to women

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who had pursued for four years a course of study equivalent to that for which the same degree was conferred in the School of Arts, and might study for higher degrees under the direction of the professors of the college, but could in no case obtain instruction from the faculty. In 1889 this need was supplied by the founding of Barnard College (q.v.). Evelyn College, at Princeton, N. J. (1887), sustains a relation to Princeton University similar to that of Barnard to Columbia.

The work of promoting the higher education of women, which in the early part of the century depended on the courage and persistency of scattered individuals, has in the last fifty years been carried on largely by organizations, such as the Woman's Educational Association of Boston; the Massachusetts Society for the University Education of Women, incorporated, 1877; the Association of College Alumnæ (1882); the Western Association of Collegiate Alumnæ (1883), and the Association for Promoting the Higher Education of Women, of New York city (1882). At the present time every degree, except that of D.D. is open to women. The movement in England was promoted by the Girls' Public Day School Company; the College of Preceptors, a society for improving secondary education (established 1849), which in 1860 began admitting candidates from girls' schools to its examinations; the Cambridge Association for the Promotion of the Higher Education of Women, with which the Newnham Hall Company was amalgamated in 1879; the Woman's Education Union, formed in 1872; the London Association of School-mistresses, and other organizations. In 1863 the Cambridge local examinations were extended to women on trial, and in 1865 came formally into effect. In 1869 Oxford granted a similar favor, and in that year Cambridge and London University instituted higher local examinations for women, followed in 1865 by Edinburgh, in 1870 by the two Irish universities, and by Glasgow and Durham. The first women's college, Girton (q.v.), was opened in 1870, and the second, Newnham, also at Cambridge, was practically commenced in 1871. In 1881 Cambridge opened to Girton and Newnham its tripos and honor examinations, and in 1884 Oxford opened its honor examinations to women. Queen's and Bedford Colleges, London, Queen Margaret's, Glasgow, Queen's College, Dublin, and Holloway College (q.v.), are among the results of the effort toward higher education. Aberdeen gives women who pass its examinations a higher education certificate; St. Andrews, the degree of Literate of Arts. Owens College, Manchester, has a department for women, and at Birmingham, Leeds, Bristol, and other places there are special institutions or courses of instruction in connection with universities.

COL'LES, CHRISTOPHER, 1738–1821; a native of Ireland, who came to America before the revolution and delivered lectures in New York on land-locked navigation. One of the first steam engines made in the country was designed by him; and he was among the earliest to propose water-supply by reservoirs for the city of New York. He anticipated the great Erie canal as early as 1784, when he recommended to the legislature the connecting of lake Ontario with the Hudson river by canals and such natural channels as could be used, and with this purpose in view he surveyed the Mohawk river. He first explored the principal roads of the state of New York, and published descriptions of them.

COL'LETON, a co. in s.e. South Carolina. on the Atlantic ocean, intersected by the Plant System railroads; 1920 sq. m.; pop. '90, 40,293. Co. seat, Walterboro.

COLLIE, a breed of dog found in all civilized countries, but originally confined to Scotland and northern England. It is familiarly known as the Scotch shepherd dog, and is noted for its intelligence. It has a strong frame, keen eyes, small ears, round and cat-like feet, and a thick and beautiful coat.

COL'LIER, JEREMY, a celebrated non-juring clergyman, was b. in Cambridgeshire on the 23d Sept., 1650. He went to Cambridge in 1669, and took his degree of M.A. in 1676. At the revolution of 1688, he first plunged into the stormy waters of controversy, his foeman being Burnet, afterwards bishop of Salisbury. For a publication of his at this time, entitled *The Desertion Discussed*, which gave offense to the government of William, he was sent to Newgate, where he remained several months. On his release, he rushed anew into the wars of party, and distinguished himself therein by the publication of several controversial works. Suspected of being a partisan of the Stuarts, he was again arrested in 1692, and imprisoned for a short time in the king's bench. From this period, his life was a scene of perpetual literary strife, government being the principal object of his attack. He died in London, 26th April, 1726. C. wrote many books, including the *Ecclesiastical History of Great Britain;* but the work by which he is best known is his *Short View of the Immorality and Profaneness of the English Stage*, published in 1698.

COLLIER, JOHN PAYNE, a well-known Shakespearean critic and commentator, was b. in London in 1789. In 1820 he published *The Poetical Decameron*, in 2 volumes. From 1825 to 1827, he superintended a new edition of Dodsley's *Old Plays*, in 13 volumes. Mr. C., whose position, in connection with the library of the duke of Devonshire, gave him great advantages for the study of our early dramatic literature, published in 1831, in three volumes, what may safely be called his best work, a *History of English Dramatic Poetry to the Time of Shakespeare, and Annals of the Stage to the Restoration*. From 1835 to 1839, he published, also in three volumes, *New Facts regarding the Life and Works of Shakespeare*. He also gave to the public an edition of the works of the illustrious bard

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of Avon (1842–44). Not content with these efforts for the illustration of his favorite author, Mr. C., in 1852, published a volume, entitled *Notes and Emendations to the Text of Shakespeare's Plays, from Early Manuscript Corrections in a Copy of the Folio of* 1632, *in the Possession of J. P. Collier*. This publication excited great commotion in the literary world; opinion was divided, and the *Emendations* were furiously applauded or furiously assailed. It was in time generally admitted that many of them were just corrections of typographical errors; that many, in cases where the author's meaning was doubtful, displayed very remarkable ingenuity; but that others darkened texts which, save to a commentator, were transparent enough. Later, it was even alleged by some that C. had himself written the marginal emendations in a feigned hand. In 1866, he commenced a series of reprints of our early poets and pamphleteers. His last work is his *Bibliographical Account of Rare Books* (1865). He d. 1883.

COLLIMATOR, AND COLLIMATION, in astronomy, determining the zenith point on a vertical circle without using the plumb line, the spirit level, or any reflecting surface, and that too at any moment of time. There are two kinds of collimators, the horizontal, and the vertical. The horizontal collimator is a telescope of small dimensions, firmly attached to a cast-iron plate floating on mercury, and having a cross wire in its focus. A telescope thus arranged, when placed on the surface of a basin of mercury, will always assume a horizontal position. By illuminating the cross wires the rays from them will issue parallel, and may always therefore be brought to a focus by the object-glass of any other telescope; in which they will form the image of any celestial object in their direction. The vertical collimator consists of a vessel of mercury towards which the object-glass of a telescope, attached to a circle or transit instrument, may be directed, so that the cross wires in its focus may be reflected in the mercury. The wires of the instrument are illuminated by a lamp placed laterally so that the rays from the lamp may be conducted to the wires without entering the eye of the observer; the telescope is then directed to the surface of the mercury. The rays issue from the wires in parallel lines, and are reflected back to the object-glass, which is enabled to collect them again to its focus. By this means a reflected image of the cross wires is formed which indicates the vertical position of the tube with great accuracy.

COLLIN, a co. of n.e. Texas, watered by one of the branches of Trinity river: 880 sq.m.; pop. '90, 36,736, inclu. colored. Agriculture and stock-raising are the chief occupations. Co. seat, McKinney.

COL'LINE is a term applied to common gelatine, or glue (q.v.).

COLLINGS, JESSE, M.P., was born in 1831, in the parish of Littleton, Exmouth, Devon. At the age of nineteen he lost his father, and entered a mercantile service as junior clerk. By rapid progress he became in 1866 the head of the firm of Collings & Wallis, in Birmingham. He took a great interest in national education, and in 1873 was elected to the Birmingham school board, becoming mayor of the city in 1878. In 1880 he went to parliament, and again in 1885. In politics he was a radical, but heartily opposed to the Gladstonian policy regarding Ireland. In 1886 and 1895 he was elected as a unionist for the Bordesley division of Birmingham.

COLLINGSWORTH, a co. in Texas; formed 1876, organized 1890; on the line of the Denver and Fort Worth railroad. Pop. '90, 357; area, 900 sq. m. Co. seat, Wellington

COLLINGWOOD, a town in Simcoe co., Ontario, Canada, on the Georgian bay; pop. '01, 4939. It is important as the terminus of the northern railway on the line of travel to and from lake Superior, and has a large lumber and grain trade.

COL'LINGWOOD, CUTHBERT, Admiral Lord, was b. at Newcastle-upon-Tyne. 26th Sept., 1750. Sent to sea as a midshipman at the age of eleven, his life thenceforth, with the exception of some half-dozen years, was spent wholly on board ship. He was an intimate friend of Nelson, whom he followed up the ladder of promotion step by step, until Nelson's death left the topmost round vacant for himself. Among the great naval victories in which C. bore a prominent part, were those of lord Howe off Brest in June, 1794; of lord Jervis off cape St. Vincent in 1797; and of Trafalgar in 1805, where he held the second command. In the last-named engagement, his ship was the first to break through the line of the combined French and Spanish fleets; and after Nelson had received his death-wound, he assumed the chief direction, and completed gloriously the triumph which had been so daringly commenced. A peerage was his reward for his gallant conduct in this battle. After several years' able service in the Mediterranean, C. died at sea, Mar. 7, 1810.

COLLINS, ANTHONY, an able free-thinking writer on religious questions, was b. in 1676, at Heston, near Hounslow, in Middlesex. He studied at Eton, and afterwards at King's college, Cambridge. In 1707, he published his *Essay Concerning the Use of Human Reason;* and in 1709, his *Priestcraft in Perfection*, etc., which fluttered the churchmen of that time exceedingly. The controversy excited by this last work induced C. to write his *Historical and Critical Essay on the Thirty-nine Articles*. His next work was a *Vindication of the Divine Attributes*, in reply to the archbishop of Dublin, who asserted the compatibility of divine predestination and human freedom. C. was a philosophical necessitarian, and afterwards advocated his opinions more fully in his *Philosophical Inquiry Concerning Liberty and Necessity* (1715). In 1711, he went to Holland, where he made the friendship of Le Clerc and other eminent *literati*. On his return to England, he published his *Discourse on Free-thinking*, the best known and

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the most important of all his works. In 1718, he was made treasurer for the co. of Essex; and in 1724, appeared his *Grounds and Reasons of the Christian Religion*, which gave occasion to no less than thirty-five replies. Two years later, he defended himself in his *Scheme of Literal Prophecy;* and in 1727, published his last work, *A Reply to Dr. Roger's Eight Sermons on the Necessity of Revelation and the Truth of Christianity.* C. died in Dec., 1729. He was a friend and correspondent of Locke, who declared that "C. had as much love of the truth for the truth's sake, as ever he had met with in anybody." His character for integrity and benevolence stood very high.

COLLINS, MORTIMER, 1827–76; an English poet and novelist, early engaged in journalism in London. In 1855, he published a volume of lyrics, and ten years later his first novel, *Who is the Heir?* and another volume of verse. *The Inn of Strange Meetings*, was issued in 1871, and the next year he produced his longest poem, *The British Birds, a Communication from the Ghost of Aristophanes.* He was a prolific contributor to journals and magazines. His *Sweet Anne Page* was very popular.

COLLINS, PATRICK ANDREW, b. Ireland, 1844; came to the U. S. 1848; admitted to the bar, 1871; was a member of the Mass. house of representatives, 1868–69; and of the state senate, 1870–71; judge advocate of Mass., 1875; elected to XLVIIIth congress, as a dem., and re-elected to XLIXth congress. He is a popular speaker; was chosen president of the Irish land league, 1884; and became U. S. Consul at London, England, in 1893.

COLLINS, WILLIAM, a poet of considerable merit and reputation, was b. Dec. 25, 1721, at Chichester, where his father was a hatter. He received his education at Winchester college and Oxford. In 1742, he published a small volume containing the *Oriental Eclogues*, and in 1743 the *Epistle to Sir Thomas Hanmer.* These are not so characteristic of his genius as his later writings. Although the publication was not attended with success, he resolved upon a literary career, and with this object went to London in 1744. Here, from time to time, he published other poems, chiefly consisting of odes; but misfortunes, occasioned chiefly by his own indolence and irresolution, finally rendered him a prey to melancholy, which at times deepened into insanity. This has imparted an interest to his memory which his works alone might not have been able to excite. He died at Chichester in 1759. The poems which he has left are comparatively few; but they entitle him to no mean rank among the poets of the 18th century. He was essentially a lyrical poet; and it is upon his odes that his reputation is principally founded. All his best qualities are exhibited in the well-known ode on *The Passions*—a poem which, at the time it was written, was undoubtedly one of the finest odes in the language. The personification of the passions is true and striking, and the variation of the measure is well adapted to the various emotions to be expressed. Among his other pieces may be mentioned the odes *To Liberty, To Mercy, To Evening, Ode written in* 1746, and the first part of the ode *To Fear.*

COLLINS, WILLIAM, R.A., a distinguished English artist, was b. in Great Tichfield street, London, Sept. 18, 1788. C. early displayed a decided taste for art. In 1807, he entered the royal academy as a student, and in the same year he exhibited two pictures at the academy's exhibition. At first, necessity obliged him to devote himself to portraits, but money coming in rapidly, he was soon able to give his genius its bent; and his children swinging on gates, his children gazing in delighted wonderment on the newly discovered nest, his coast-scenes, his groups of prawn-fishers, his shrimpers on the ebbed sea-beach, drew admiring eyes as they hung on the academy walls, and brought remunerative prices. C. was elected R.A. in 1820. In 1836, he visited Italy, and remained there nearly two years, studying the great masters, and sketching monks and peasants, and groups of bronzed children. In 1839, he sent to the academy several Italian pictures, which were greatly admired. His attempts in another direction—"Our Saviour with the Doctors in the Temple" (exhibited in 1840), and "The Two Disciples at Emmaus" (1841)—were not successful. He died in 1847

COLLINS, WILLIAM WILKIE, son of the preceding, was b. in 1824, and was educated for the bar. He was widely known as a novelist and miscellaneous writer. He is a great master of mystery, and can so hide a secret in a wrappage of circumstance, that, before it is discovered, the whole tissue must be unrolled. Several of his works are models of construction; and in working out his plots, he diverged neither to left nor right, indulging neither in irrelevant pathos nor description. His principal works are *Antonina; Basil; Hide and Seek; After Dark; The Dead Secret;* and *The Woman in White* (1860); *No Name; My Miscellanies; Armadale; The Moonstone; Man and Wife* (1870); *The New Magdalen* (1873); and *The Law and the Lady* (1875); *Black Robe* (1881). He d. 1889.

COLLINSON, PETER, 1694–1768; an English botanist, a member of the society of Friends. He corresponded with Benjamin Franklin, Cadwallader Colden, and other men of science of the period, and is said to have sent to Franklin the first electrical machine known in America. One of his pursuits was the naturalization of plants, flowers, and trees. He sent English plants to America and brought American plants to his own country, successfully introducing many new species. He is also credited with first suggesting grape cultivation in Virginia.

COLLISION, in mechanics, the meeting of two bodies, one or both of which are at the tim in motion. The motion or velocity of the bodies after the contact depends upon their firmness, or solidity. If perfectly incompressible, they will move together

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as one body; if elastic, they will be more or less compressed, but will resume their shape, and the motion will depend upon the amount of force created by the collision.

COLLISIONS OF VESSELS. To prevent vessels running against one another in passing, there is a "rule of the road" (q.v.) at sea as well as on land. In England regulations are laid down which, though not having the force of law, are recognized by the admiralty, and govern the decisions in cases of collision. In general, they are analogous to the rules observed by pedestrians in crowded thoroughfares, and by vehicles on highways. It is at night that the danger of collision is greatest; and hence the necessity for a well-arranged system of lights and other precautions. Of 3575 casualties of all kinds on and near the coasts of the United Kingdom in 1880–81, 713 were due to collisions; of these 69 resulted in total loss. The Cunard line of steamers, running between Liverpool and New York, have adopted the "lane-system" advocated by Lieut. Maury, U.S.N.

It has been held by American courts that, if a collision happens without fault, and no blame can be charged to those in charge of either vessel, each party must bear its own loss. In case both parties are at fault, neither can have relief at common law; but maritime courts aggregate the damage to both vessels and their cargoes, and divide the amount equally between the two. In case of inscrutable fault, that is, by a fault of those in charge of one or both vessels, and yet under such circumstances that it is impossible to learn who is at fault, the rule of equal division is also adopted. Where the fault is on the part of one vessel and no fault on the other, the owners of the vessel at fault must bear their own loss, and are also liable for the damage to the other vessel. In some cases the personal liability of owners is limited to the value of the vessel and freight. Strict laws, rules, signals, etc., are adopted by all nations to prevent collision. (See NAVIGATION LAWS.) But, no matter how exacting may be the rules, cases will occur when their following would result in disaster. No vessel should unnecessarily incur the probability of collision by strict adherence to the rules. If it is clearly in the power of one vessel to avoid collision by departing from the rules, she will be held bound to do so; but a vessel is not required to depart from the rule when she cannot do so without danger. A proper lookout must be kept; the absence of such a lookout is in itself evidence of negligence. In some cases certain lights must be kept. Losses of the injured vessel by collision are within the ordinary policy of insurance; but when the collision is the fault of the insured vessel, or of both vessels, the insurer is not ordinarily liable for injury done to the other vessel which may be decreed against the vessel insured; but recent policies provide that the insurer shall be liable in such case.

COLLITZ, HERMANN, PH.D., was b. at Bleckede, Hanover, in 1855, and studied at Göttingen and Berlin. He was privat docent in the university of Halle, in 1885. In 1878 he first published papers on the Indo-Iranian laws of palatals and has made many contributions to German and American philological journals. In 1883 he undertook, with Bezzenberger and others, the *Sammlung der Griechischen Dialektinschriften*, of which vol. I. (1884), and parts of vols. II.–IV. (1885–90) have appeared. In 1886 he was appointed professor of comparative philology at Bryn Mawr College.

COLLO'DION (Gr. *kollao*, to stick). This substance, on its first introduction, employed in surgery as a preservative of wounds, etc., from contact of air, by means of the tenacious and transparent film which it leaves on evaporation—and now, also, in a slightly modified form, remarkable as the basis of a highly sensitive process for taking pictures by the agency of light—may be defined as a solution of *pyroxyline* in a mixture of alcohol and ether, to which is added, for photographic operations, a small quantity of some soluble iodide, bromide, or chloride.

The first step in making C. is the preparation of pyroxyline: Take 10 fluid oz. of sulphuric acid, specific gravity 1.84, in a dish; add 12 fluid drams of water, and 10 fluid oz. of nitric acid, specific gravity 1.45; and raise the temperature to 140° by immersing the dish in boiling water. One oz. of pure linen or paper should now be immersed in small pieces at a time, keeping the mixture in motion until the liquid is nearly absorbed by the linen or paper.

The action having continued for about ten minutes, the contents of the dish should be plunged into a vessel containing a large quantity of water, which should be speedily poured off and repeatedly changed, until the linen or paper is so thoroughly washed as not to give the slightest indication of acid to the most delicate test-paper, after which it should be slowly dried at a low temperature, and preserved in a glass bottle for use.

One hundred and four grains of the pyroxyline thus prepared are dissolved in a mixture of 16 oz. of pure sulphuric ether, and 2 oz: alcohol, specific gravity .840; and to this mixture are added 48 grains iodide of cadmium, 30 grains iodide of potassium, and 25 grains bromide of cadmium, dissolved in 4 oz. of alcohol, of specific gravity .840. C. thus prepared should, after becoming clear by subsidation, yield a rich creamy film of iodide and bromide of silver on immersion in the nitrate bath.

The foregoing formula yields a C. very suitable for taking what are termed *negative* impressions in the camera; but when it is desired to take *positive* pictures, cotton wool should be substituted for linen or paper in the preparation of the pyroxyline, and the iodizing solution should contain iodide of ammonium instead of iodide of potassium. It is important also that the alchol employed should be free from organic impurities in the shape of fusel and grain oils, small traces of which mar the purity of the high light in a positive, though their presence is comparatively harmless in a negative phe-

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tograph. For surgical purposes a *flexible* C. is used, composed of C., combined with certain proportions of Canada balsam and castor-oil. See also CELLULOID and GUN COTTON.

COLLO'DIONIZED PAPER PROCESS. Paper being substituted for glass in this process, as a basis upon which to support the film, a great increase in portability is arrived at, as the sensitive sheets may be carried in a portfolio, and employed in the same manner as dry collodion plates. There are difficulties, however, in the way of its successful practice, which have prevented it from becoming as popular as it deserves to be. The following is a brief summary of the manipulations. Mr. Corbin, the inventor of the process, ascertained that a peculiar collodion was requisite, the formula of which is as follows: ether, 650 parts; alcohol, 350 parts; pyroxyline, 15 parts; iodine, 1½ parts. The collodion so prepared is poured on the glass in the usual way, and sensitized in a bath containing only 1 per cent of nitrate silver, and a ¼ per cent of nitric acid. The plate having remained in this bath about 2 minutes, is withdrawn, and freely washed with water; it is then immersed in a solution of 1 per cent of iodide of potassium, to insure the complete decomposition of the whole of the free nitrate of silver not removed by the washing. A piece of negative paper is now coated with a solution of gelatine, containing 6 parts of gelatine to 100 parts water; the dimensions of the paper should be rather less than the glass, and the gelatinized side is brought into contact with the collodion film in a dish of water, any intervening water being expelled by passing a glass rod lightly over it. The edges of the collodion film which project beyond the paper are folded back on it, and the film and paper removed together. The now collodionized paper is laid, film uppermost, on a glass plate, coated with a preservative solution, composed of equal parts of albumen and honey, diluted sufficiently to enable it to flow freely over the paper. The film is lastly sensitized in a solution of nitrate of silver, 5 parts; glacial acetic acid, 5 parts; water, 100 parts; it is then freely washed as before in water, and hung up to dry. As it is apt to wrinkle in drying, it should be attached by all four corners to two lines, running one under the other.

COLLOID, a name applied by Graham to a yellowish, transparent, viscid matter of gelatinous appearance. Starch, gum, albumen, and gelatine are examples of colloids; and the name is used in contradistinction to *crystalloids.*

COLLOT D'HERBOIS, JEAN MARIE, one of those men who gained an infamous notoriety in connection with the first French revolution, was b. in Paris, 1750. Originally a provincial actor, the revolutionary movement attracted him to Paris, where his impudence, his loud voice, and his *Almanach du Père Gérard,* which obtained the prize of the Jacobin club, secured for him public recognition, and he was elected to the national convention as one of the deputies for Paris. His general ferocity marked him out as a fit person for the presidency of the convention, to which he was appointed June 13, 1793, and as a member of the murderous committee of public safety. Sent by Robespierre to Lyons, in Nov., 1793, C. took bloody revenge on the inhabitants for having once hissed him off the stage in the theater. Not less than 1600 persons were destroyed by the guillotine and by discharges of grape-shot. An attempt made to assassinate C. (May 23, 1794) served only to increase his popularity, and thus excited the envy of Robespierre, who determined to destroy so formidable a rival. C. therefore took a prominent part in the overthrow of Robespierre and his party in July, 1794, but the reaction following this event proved fatal to himself. C. was expelled from the convention, and in Mar., 1795, was sentenced to deportation to Cayenne, where he caught a fever, and died in great agony, Jan. 8, 1796.

COLLU'SION, an agreement between two or more persons to defraud. The law abhors C., and consequently it has the effect of voiding every transaction which is founded upon it. Arrangements between bankrupts and creditors whom they wish to favor, on the eve of bankruptcy, are amongst the most frequent instances of C., and one of the leading objects of all systems of bankrupt law has been to defeat them. In England, C. is spoken of as "a deceitful agreement or contract between two or more persons, for the one to bring an action against the other, to some evil purpose, as to defraud a third person of his right."—*Tomlin's Dictionary.* But there is no limit to the circumstances in which the occurrence of C. is conceivable in any country.

COLLYER, ROBERT, b. England, 1823. He emigrated to the United States in 1847, and became a Methodist minister. In 1850, he adopted Unitarian views, and soon became one of the most famous preachers of that denomination. From 1859 to 1879 he was pastor of the Church of the Unity, Chicago; from 1879 to 1896 he held the active pastorate of the Church of the Messiah, New York City; and in the last year was provided with an assistant. He was widely popular as preacher, author, and lecturer.

COLMAN, BENJAMIN., D.D., 1673–1747; b. Boston; graduate of Harvard, 1692. He was the first pastor of the Brattle street church in Boston, holding the place until his death, a period of nearly 50 years. He was chosen president of Harvard college, but declined the office. His sermons and some poems were published.

COL'MAN, GEORGE, commonly called "the Elder," a dramatic author and theatrical manager of last century, was b. at Florence about 1733. In 1760, his first dramatic piece, entitled *Polly Honeycomb,* was produced at Drury Lane with great success. Next

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year, he gave to the world his comedy of *The Jealous Wife*, and in conjunction with Mr. Garrick, he in 1766, wrote *The Clandestine Marriage*. In 1761, he became one of the purchasers of Covent Garden theater, and held the office of acting manager for seven years, after which period he sold his share. In 1777, he purchased the theater in the Haymarket from Mr. Foote. In 1785, he was attacked by palsy, and never recovered; he died Aug. 14, 1794. C. was an industrious author; besides poetry and translations, he wrote and adapted upwards of 30 dramatic pieces.

COLMAN, GEORGE, " the Younger," son of the preceding, was b. Oct. 21, 1762. His bent lay in the same direction as his father's, during whose illness he acted as manager of the Haymarket theater; and on the death of the elder Colman, George III. transferred the patent to his son. C. held, for a considerable time, the office of examiner of plays. In industry, he rivaled his father, and he received large sums for his dramatic writings, some of which continue in possession of the stage. He wrote many humorous verses, among which were *Broad Grins* (1802) and *Poetical Vagaries* (1812). He was twice married, and died on the 26th Oct., 1826. His last literary work was *Memoirs*, published in two volumes.

COLMAN, HENRY, 1785–1849; b. Boston; graduate of Dartmouth; minister of a Congregational church at Hingham from 1807 to 1820; and from 1825 to 1831, Unitarian pastor in Salem. He was agricultural commissioner for Massachusetts, and published (after a trip to Europe) *Agricultural and Rural Economy in France, Belgium, Holland, and Switzerland; European Agricultural and Rural Economy; European Life and Manners, in Letters to Friends;* and also reports on the silk culture, and on the agriculture of Massachusetts.

COLMAN, SAMUEL, b. Maine, 1832; an artist noted for American and foreign landscapes in oil and water colors, and for vigorous etchings.

COLMAR, a city ceded to France in 1697, and repossessed by Germany since 1870, the capital of upper Alsace, stands on a plain near the Vosges, 41 m. s.s.w. of Strasburg. A stream of water from the Lauch and Fecht, at the confluence of which the town stands, flows through and keeps the streets clean. Among the principal buildings of C. are the cathedral, the Dominican church, the college, court-house, and town-house. C. is a busy place—one of the chief seats of the cotton manufacture in Alsace. Water, being abundant, is the principal motive power in driving the machinery, but steam is also employed to a considerable extent. Other manufactures are paper, leather, ribbons, and hosiery. C. is an old place, having been raised to the rank of a city in 1220. About the end of that century, it was made a free town, and rapidly became one of the most prosperous in upper Alsace. Fortified in 1552, its fortifications were razed in 1673 by Louis XIV. Pleasant boulevards now occupy their place. Pop. 90, 30,411.

COLNE, a t. in the e. of Lancashire, on a high ridge near the source of the Calder, a western branch of the Ribble, 32 m. n.e. of Manchester, at the junction of the Lancashire and Yorkshire and Midland railways. It has manufactures of cotton calicoes and mousselines-de-laine. Coal, slate, and lime abound in the vicinity. Pop. '91, including Marsden, 16,744. C. is an ancient place, by some supposed to be the *Colunio* of the Romans. Many Roman coins have been found here. As early as the beginning of the 14th c., it was the seat of woolen manufactures.

COLOCO'LO, a large cat, native to the n. part of South America. It is wild and very ferocious, making great havoc among monkeys and other small animals.

COL'OCYNTH (Gr. *kolokynthis*), a well-known medicine, much used as a purgative, is the dried and powdered pulp of the *colocynth gourd, coloquintida, bitter apple*, or *bitter cucumber*, a globose fruit about the size of an orange, of a uniform yellow color, with a smooth, thin, solid rind. The plant which produces it, *cucumis* (or *citrullus*) *colocynthis*, is nearly allied to the cucumber (q.v.). It is common in Asia, Africa, and Spain, which last country supplies no small part of the C. of commerce. The fruit is gathered when it begins to turn yellow, peeled, and dried quickly either in a stove or in the sun. It is chiefly in the form of a dried extract that it is used in medicine. It owes its properties to a bitter principle called *colocynthine*, which is more or less abundantly present in the fruits of many of the gourd family. It is a curious fact, but to which there are many analogous, that the seeds of the C. plant, produced in the midst of its medicinal pulp, are perfectly bland, and they even form an important article of food in the n. of Africa. —The name false C. is sometimes given to the orange gourd (*cucurbita aurantia*), sometimes cultivated as an ornamental plant in our gardens, on account of its globose, deep orange fruit. The pulp of the fruit possesses the properties of C., but in a milder degree.

C. is generally administered in the form of pills, in which the extract is associated with aloes, scammony, and in some cases with calomel, or with extract of hyoscyamus. In small doses, the C. acts as a safe and useful purgative; and when accompanied by hyoscyamus, the latter prevents much of the pain and griping which are attendant on the use of C. by itself. In large doses, C. is a poison.

COLOC'ZA, or KALOCSA, a t. of Hungary, situated on the left bank of the Danube, 68 m. s. of Pesth. It has an archiepiscopal palace or castle, and a cathedral. Pop. '90, 18,176, who are chiefly engaged in the fisheries on the Danube, and in the breeding of cattle. There is a steam-packet station at Colocza.

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COLOGNE' (Ger. *Köln;* the *Colonia Agrippina* of the Romans), a city and free port on the left bank of the Rhine, in lat. 50° 56′ n., long. 6° 58′ east. Formerly an independent city of the German empire, it is now the chief city of Rhenish Prussia. C. is a fortress of the first rank, forming a semicircle, with the Rhine as its chord, and the town of Deutz on the opposite bank as a tête-du-pont. It is connected with this suburb by a bridge of boats, and a fine iron bridge 1362 ft. in length, for railway and carriage traffic. Pop. '71, 129,233, only 16,746 of whom were Protestants; '95, 321,431. In the old quarter the streets are narrow and crooked, but the suburbs are modern and well laid out. The public buildings are numerous. The church of St. Ursula is noted as the place where are preserved the bones of 11,000 virgins, companions of St. Ursula, who, according to the legend, were slaughtered at C. by the Huns, because they refused to break their vows of chastity. In the "golden chamber" are the coffin of the saint, and the skulls of a few of her most favored maidens encased in silver. The church of St. Gereon, the first portion of which was founded in 1066, boasts of the possession of the bones of St. Gereon, and of the 6,000 Theban martyrs slain during Diocletian's persecution. The church of St. Peter is celebrated for the altar-piece of the crucifixion of St. Peter by Rubens, and that of the Minorites for containing the tomb of the famous scholastic, Duns Scotus. The chief object of interest in the city, however, as well as its greatest ornament, is the cathedral, one of the noblest specimens of Gothic architecture in Europe. This cathedral is said to have had its origin in an erection by archbishop Hildebold, during the reign of Charlemagne in 814. Frederic the Red-Bearded bestowed upon it, in 1162, the bones of the three holy kings, which he took from Milan, and this gift contributed greatly to the increase of its importance. The bones are retained as precious relics to this day; but the old structure was burned in 1248; according to some accounts, the present cathedral was begun in the same year, but others fix the date of its commencement in 1270–75. To whom the design of this noble building is to be ascribed, is uncertain. The choir, the first part completed, was consecrated in 1322. The work was carried on, sometimes more actively, sometimes more slowly, till the era of the reformation, when it was suspended; and during the subsequent centuries, not only was nothing done to advance it, but what had been already executed, was not properly kept in repair. In the beginning of the nineteenth century, however, attention was directed to its unrivaled beauties, and it has since become the subject of an enthusiasm extending over all Germany, and which has given birth to a multitude of associations for the supply of the necessary funds to repair and complete it according to the original design. Funds have also been forthcoming from other parts of Europe. On Sept. 4, 1842, the king of Prussia, who had contributed largely to the funds, laid the foundation stone of the transept, since which time great progress has been made. The naves, aisles, and transepts were opened in 1848. The magnificent s. portal was completed in 1859, and the n. has also been finished; and in 1860, the iron central spire was added. With the exception of the towers, the whole was finally completed in Oct., 1863. The body of the church measures 500 ft. in length, and 230 ft. in breadth. The towers were finished in 1880, and are over 500 ft. high. The total cost of the whole is estimated at $10,000,000. The situation of C. is extremely favorable for commerce, and it has long possessed a considerable and increasing importance in this respect. Various branches of manufacture are carried on, of which the chief are the making of beet sugar, tobacco, glue, carpets, soap, leather, furniture, pianos, chemicals, and spirits of wine, besides the characteristic manufacture of eau-de-Cologne (q. v.). C. has extensive and important railway connections.—The city was founded by the Ubii, about 37 B.C., and was at first called *Ubiorum oppidum;* but a colony being planted here in 50 A.D. by Agrippina, the wife of the emperor Claudius, it received the name of *Colonia Agrippina.* At the partition of the Frank monarchy in 511, it was included in Austrasia; and by a treaty in 870, was united to the German empire. It entered the league of the Hanse towns in the beginning of the 13th c., and contended with Lübeck for the first rank. It was at a very early period the seat of a bishopric, which was elevated, in the end of the 8th c., into an archbishopric, and the archbishops acquired considerable territories, some of them distinguishing themselves as politicians and warriors. They took their place amongst the princes and electors of the empire, but were involved in a protracted contest with the citizens of C., who asserted against them the independence of the city, and the archiepiscopal residence was therefore removed to Bonn. The archbishopric was secularized in 1801, when the city also lost its independence, and the congress of Vienna did not attempt to restore to it its former character, but assigned the whole territories to Prussia. The archbishop, therefore, has not now the political rights and power that belonged to his predecessors.

COLOGNE WATER. See EAU DE COLOGNE.

COLOGNE YELLOW is a pigment composed of 2 parts of yellow chromate of lead, 1 of sulphate of lead, and 7 of sulphate of lime or gypsum.

COLOM'BIA, immediately after the war of independence, was a term which embraced all that now belongs to the three republics of Venezuela, United States of Colombia, and Ecuador; being the entire n. of South America, and the extreme s. of what is geographically distinguished as Central America. Independently of the singular difficulties of communication, and of the resulting absence of anything like natural unity, this unwieldy state contained, from the beginning, the cause of its own dissolution in the national character of its inhabitants. So long as union was necessary to meet external

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dangers, C. maintained an imposing attitude in the eyes of the world; but gradually sectional interests and political jealousies did their work, and, at last, about 1830, the ill-assorted elements of the confederation were separated forever.

COLOMBIA, THE REPUBLIC OF, the most north-western division of South America, extends from 12° 25′ n. latitude to 5° 8′ s. latitude, and from 70° 40′ to 82° 40′ n. longitude, and comprises an area of 513,845 square miles. It is bounded on the north by the Caribbean sea; east, Brazil and Venezuela; south, Brazil, Ecuador, and Peru; and west, Pacific Ocean and Central America. Its coast line of nearly 3000 miles, with commodious bays on both Atlantic and Pacific coasts, and several fair harbors even on the less favored coast to the south, gives to Colombia a location that presents fine commercial possibilities. The surface, with its lofty mountains in the west and its vast llanos in the east, is extremely diversified. Three great ranges of the Andes, known as the Western, Central, and Eastern Cordilleras, spread out like a fan from the plateau of Pasto and Tuquerrez (14,000 feet high), in the southwest, while between these chains lie the long and beautiful valleys of the Magdalena and Cauca, the two principal rivers of Colombia. The central chain contains the highest peaks, Tolima, a volcano (18,270 feet), being the highest. The eastern Cordillera comprises a series of extensive tablelands, cool and healthy, where the white population is chiefly located. Eastward from these tablelands stretch the llanos or grassy plains, through which flow several large tributaries of the Orinoco. The lakes are quite unimportant. The geology of the country is very extraordinary. "Everywhere," we are told, "are found traces of stupendous cataclysms, and a disarrangement and intermixture of primitive and sedimentary rock, which seem to put all classification at defiance." In the course of one day's journey, the traveler may experience in this country all the climates of the world. Perpetual snow covers the summits of the Cordilleras, while the rich vegetation of the tropics covers the valleys. In some parts of the country, especially in the departments of Cundinamarca, Boyacá, Santander, Tolima, Cauca, Bolivar, and Magdalena, agriculture is the principal industry, but the agricultural resources have not been fully developed. Large quantities of cacao are raised and exported. Wheat and barley are raised, and coffee is the main article of export, the chief coffee centres being Cundinamarca, Santander and Tolima. Cotton is grown to some extent. Cinchona is abundant, but the great cost of transporting it to the coast hinders its exportation. Cattle raising is followed almost universally. The manufacturing industries are backward, and the chief articles produced are sugar, molasses, cotton, woolen cloth, some articles of iron, sole leather, saddles, shoes, furniture, straw hats, jewels, varnishes, pottery, cigars, brandy, rum, etc. The country is rich in minerals, gold being found to some extent in all departments. Both gold and silver are exported. Other minerals developed to some extent are copper, platinum, lead, cinnabar, mercury, manganese and emeralds. In some of the departments there are deposits of coal and petroleum. The chief exports in 1895 were coffee, gold, silver, rubber, tobacco, and hides. The main difficulty in the way of the development of manufacture is in the scarcity of native skilled labor. Until 1885 the manufacturing companies were dependent almost wholly upon foreign skilled labor. Since that date, however, there has been an increase in the supply of skilled workmen among the natives. In financial matters C. resembles the other South American republics in being on a paper basis, but in 1894 a law was passed for the redemption of the paper currency, the free coinage of gold and the coinage of small silver pieces. The amount of gold in the country, however, was very small; and of silver, down to 1896, only about 3,000,000 pesos were coined under the law of 1894, while the paper money in circulation in December, 1895, amounted to 30,862,352 pesos. The shipping of C. in 1895 was very small, the merchant marine consisting of only one steamer and five sailing vessels. The roads of the country have been in bad condition, but the government is taking steps to improve them. The railway system has not been developed, although the congress of 1894 passed a railway act giving power to the executive to grant charters for the construction and operation of railways, and to subsidize the companies up to $16,000 gold per mile. In 1896 the total mileage was 346. The northern coasts of Colombia were visited by Ojéda and Vespucci in 1499, while three years later Columbus explored a section of the country and attempted to found the first Spanish colony on the American mainland. In 1513 Balboa discovered the Pacific, and in 1526 Pizarro sailed along the western coast. In 1536 Ximenes de Quesada conquered the Chibchas, or Muyscas, the principal Indian nation, and the country became a dependency of Spain, which lasted under various forms, until 1819, when it became independent, and then joined with Ecuador and Venezuela to form the republic of Colombia, but the union was dissolved in 1829–30, and New Granada was organized as a separate republic in 1832. After several changes in the constitution (in 1843, 1851, 1853), a complete fundamental change was made in 1858, by which the separate "provinces" were changed into "states," associated under a federal government like the United States of North America, but self-governing in all internal affairs. In 1860, another revolution broke out, and for more than two years the country was devastated by civil war. This was finally ended, and a union was formed of the nine states, under the title of the "United States of New Granada," but changed in 1871 to that of the "United States of Colombia." Another revolution, begun in 1884 was terminated in 1886 by the promulgation of a new constitution. By this, the Republic, from being Federal, has become Central; and the country is known as the "*Republic* of Colombia." A rebellion broke out in 1895, but

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was promptly suppressed. The sovereignty of the nine states was abolished, and they are now simple departments, their presidents being reduced to governors under the direct nomination of the President of the Republic, whose term of office is for six years. The senate consists of twenty-seven members, three from each department, and the House of Representatives of sixty-six members, elected by universal suffrage, each department forming a constituency and returning one member for 50,000 inhabitants. The national army, in time of peace, numbers 5500 men. Roman Catholicism is the religion of the nation, but other forms are tolerated, so long as their exercise is "not contrary to Christian morals nor to the law." There is a national university, including four colleges and technical school, and there are several universities and colleges belonging to the departments, besides many public and private colleges for secondary instruction. According to the census of 1881 the population was 3,878,600, including 220,000 uncivilized Indians. In 1895 the population was estimated at about 4,000,000. The most populous departments were Boyacá, Cauca, and Cundinamarca, and the least populous was Magdalena, of which only two-thirds of the territory are inhabited. Its population was estimated in 1894 at 167,000. The chief cities are the capital, Bogota, with an estimated population of 120,000; Medellin, with 50,000; Panama, with from 25,000 to 30,000; Bucaramanga, with 30,000, and Cartagena with 20,000. Barranquilla, with a population variously estimated at from 20,000 to 40,000, is an important commercial port.

COLOM'BO, the capital of Ceylon, an episcopal city and seat of government, is situated on the western side of the island, in 6° 59′ n. lat., and 80° 4′ e. long., near a rocky headland, the *Jovis extremum* of Ptolemy, by which the mariners of antiquity steered for the port of Galle. The modern fortifications of C. were constructed by the Dutch. The fortified town is about a mile and a half in circumference. The harbor is sheltered by a breakwater, and is accessible to the largest vessels. Mail steamers to Calcutta, China, and Australia stop at the port. Colpetty, a beautiful suburb, shaded by groves of the cocoa-nut palm, is a favorite retreat. Here, the houses are chiefly of one story, with broad verandas. The large and lofty rooms are furnished with punkahs, floored with tiles, and, for the sake of air, have windows opening to the ground, at which, however, snakes, lizards, scorpions, and the teeming insects of a tropical country, make free to enter. The humble, mud-constructed dwellings of the Dutch, Portuguese, Eurasians, Singhalese, Tamils, Moors, and Malays are outside the city walls. The *pettah*, or Black Town, the only ancient quarter, extends to the river Kalany-ganga. Pop. '91, 126,926. C. is connected with Kandy by railway. The mean annual average of temperature at C. is 80° or thereabout, and has reached to 86° in extraordinary years. The annual fall of rain is 87.3 in., of which the greatest quantity is measured at the change of the monsoon, when it pours down in a perfect deluge. Out of 87.3 in., 30.2 in. fall in April and May, and 32 in. in Oct. and Nov.

The early name of C., Kalan-totta, the "Kalany ferry," so called from its proximity to the river, the Moors corrupted into Kalambu, and by this designation it was described about 1340 A.D. as the finest city of Serendib. At the arrival of the Portuguese, who fortified it in 1517 A.D., Kalambu had merged into Kolamba, or Columbu, which they henceforth wrote Colombo, in honor of Christopher Columbus. The Dutch succeeded to the Portuguese (see CEYLON), and C. was taken by the British 16th Feb., 1796.—Sir James Emerson Tennent's *Ceylon*.

COLOMBO ROOT, the root of an African vine, a mild tonic, containing columbia, berberine, and columbic acid, with starch and coloring matter

COLON. See PUNCTUATION.

COLON, that portion of the large intestine which extends from the cæcum (q.v.) to the rectum, which is the terminal portion of the intestinal canal. Whether it is derived from *koilon*, "hollow," or *kōlao*, "I arrest" (because the fæces are retained for a considerable time in it), is uncertain. It is divided into the ascending, the transverse, and descending C., and the sigmoid flexure. See ALIMENTARY CANAL.

The whole length of the C., from its commencement in the cæcum, to its termination in the rectum, is rather more than four feet. It is retained in its position by the serous membrane, which envelops, more or less, all the intestinal viscera, and is termed the peritoneum (q.v.). Its structure is essentially the same as that of the rest of the intestinal canal, which is described in the article DIGESTION, ORGANS AND PROCESS OF; but in consequence of a peculiar arrangement of the longitudinal muscular fibers, the interior of the C. is divided into sacculi, which serve to retain its contents for a longer period than if it were a uniform tube, and thus by extracting water from them, to reduce them to a more solid consistence, such as is possessed by normal excrement. In some animals, as in the horse and sheep, the shape of the fæces is completely molded in these cells.

COLON. See ASPINWALL.

COLONEL. Officers of this grade rank next above lieutenant-colonels and after brigadier-generals. They are the chief commanders of a regiment of troops, whether infantry, cavalry, or artillery. The rank is also bestowed upon officers of the staff corps. In the British army, except in the cases of artillery and engineers, the office of colonel is often honorary, and is generally conferred on distinguished officers and princes of the blood royal, the real command resting with the lieutenant-colonel of each battalion, who, after

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five years of service, becomes a colonel. English generals who have what is called "a regiment given them" as a reward for service, and virtually as a retirement, have the rank of colonel. In the Russian, German, and Austrian services the colonel of each regiment holding the title as an honor only, is usually the member of some princely or other eminent family, often foreign, and sometimes appointed in childhood. The title was first introduced from Spain about 1548, at least that is the date of the first instance of the term noted. In the U. S. army the full dress coat of a colonel has two rows of buttons, nine in each row, equal distances apart; the collars and cuffs the same color and material as the coat. The shoulder-knots have a silver embroidered eagle at the centre of the pad, measuring two inches between the tips of the wings, having in the right talon an olive branch, and in the left a bundle of arrows; also an escutcheon on the breast, as represented in the "Arms of the United States." Cloth of the straps as follows: For the general and staff corps, dark blue; infantry, white; artillery, scarlet; cavalry, yellow. The insignia of rank on the sleeve of the overcoat is five flat black mohair braids, single knot. A colonel is allowed 4 rooms as quarters, 1 as kitchen, and a number not exceeding 8 for clerks, etc., when in command of a department. He is also allowed forage for two horses, provided they are owned and kept in the performance of official duties.

COLO'NIA DO SANTIS'SIMO SACRAMEN'TO, a port of Uruguay or Banda Oriental, stands on the n. or left bank of the Plata, nearly opposite to Buenos Ayres, and about 100 m. above Montevideo, the capital of the state. The place is pretty regularly fortified. As its acquisition would tend to secure to Buenos Ayres the entire command of the interior navigation, the town was seized by Rosas, the dictator of that state; but, in the interest of the freedom of commerce, it was, in 1845, taken from him by the French and English squadrons.

COLO'NIAL CORPS were certain regiments forming part of the regular army of the British empire, and paid for out of the imperial revenues. They were never very fixed in number, varying with the circumstances of the colonies in which they were located. The following were the names of the corps, the numbers provided for in the army estimates for 1860–61, when these regiments were at their largest recent establishment, and the composition of each corps, whether British or native:

Three West India regiments (afterwards raised to five)	3,420	Negro.
Newfoundland Veterans	229	British.
Ceylon Rifles	1,585	Native.
" Invalids	168	Native.
Cape Mounted Rifles	1,084	Boers and natives.
Malta Fencibles	638	Native.
Canadian Rifles	1,106	British.
St. Helena Regiment	433	"
Gold Coast Artillery	351	Native.
Falkland Islands Company	37	British.
African Artillerymen	64	Native.
Hong-Kong Gun Lascars	88	"

As the colonies obtained self-government, and the military theory of employing troops only in large bodies gained ground, it was considered as against imperial polity to maintain, out of imperial revenue, corps which were tied to one colony, and not available for the general defense of the empire. Accordingly the colonial corps have been gradually disbanded, and there survive only two West India regiments and the Malta Fencibles.

COLONIZATION SOCIETY, The American, an association organized in 1816 for the purpose of transporting free and manumitted negroes from the United States to Africa. In 1819, congress appropriated $100,000 in aid of the work, and the next year the society sent out the first colonists. Henry Clay was for a long time president of the society. An important work accomplished by the society was the founding of the republic of Liberia (q. v.) on the western coast of Africa.

COLONNA, Cape (ancient *Sunium Promontorium*), a headland of Greece, forming the southmost point of Attica, in lat. 37° 38′ n., long. 24° 1′ east. Crowned by the ruins of a temple of Minerva, its summit rising about 270 feet above the water, Cape C. is a conspicuous and remarkable object from the sea. Sixteen white marble columns, from which the cape derives its modern name, are still standing.

COLON'NA, a village in central Italy, is noticed because it gives its name to the most celebrated and powerful of all the Roman aristocratic families—the Colonna—from which have sprung a pope, several cardinals, generals, statesmen, and noted scholars.

The C. palace, situated at the base of the Quirinal (Rome), is celebrated for its splendid gallery and treasures of art,

COLONNA, Giovanni Paolo, lived in the latter part of the 17th century. He was chapel-master of St. Petronia at Bologna, and president of the philharmonic academy there. The school established by him produced many good musicians, one of whom was

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Clari. His works are mostly for church services, and many of them are among the most remarkable compositions of the 17th century.

COLONNA, VITTORIA, the most celebrated poetess of Italy, a member of the above-named family, was the daughter of Fabrizzio Colonna, high constable of Naples, at whose estate of Marino she was born in the year 1490. When four years old, she was betrothed to a boy of the same age, Fernando d'Avalos, son of the marchese de Pescara. At 17, they were married. After her husband's death in the month of Nov., 1525, Vittoria C. found her chief consolation in solitude and the cultivation of her poetical genius. During seven years of her widowhood, she resided alternately at Naples and Ischia, and then removed to the convent of Orvieto, afterwards to that of Viterbo. In her later years, she left the convent, and resided in Rome, where she died in Feb., 1547. Her poems were chiefly devoted to the memory of her husband. Among them, the *Rime Spirituali* (Venice, 1548) are remarkable for truth of sentiment and enlightened piety. The most perfect edition of the poems was published by Ercole Visconti (Rom. 1844). See AVALOS.

COLONNADE is the name given to a series of columns placed at certain intervals from each other, and arranged in various ways according to the rules of art and the order employed.

COL'ONSAY, one of the western isles of Scotland, off the s.w. part of the mainland of Argyleshire, in the wide entrance of the firth of Lorn, between the isles of Islay and Mull, with the small isle of Oronsay, at the s. end, separated by a narrow sound, which is dry at low water. C. and Oronsay are together 12 m. long from n.e. to s.w., and 1 to 3 m. broad. The surface is irregular, and composed of mica-slate, passing into chlorite-slate and clay-slate, and mixed with quartz-rock and limestone. Half the surface is cultivated. Next to Iona, C. contains the most extensive remains of religious edifices in the Western isles. On Oronsay stands a large stone cross and the ruins of a monastery founded by the lords of the isles in the middle of the 14th century.

COLONY (Lat. *colonia*, from *colonus*, a husbandman; the first inhabitants of a C. being generally people of agricultural pursuits). The term is loosely used to embrace various classes of distant territories subordinate to or dependent on a parent state. A C., however, properly means a body of people formed by migration to a distant region, where they support themselves by industry and the produce of the soil, and are under the protection and attached to the supreme government of the mother-country. The British colonies in Australia and North America, where the natives have either ceased to exist, or do not compete with the colonists for the ownership of the soil, are practical instances of the C. in this its proper sense; but there are many other dependencies of the British crown which deviate more or less from the true characteristics of a colony. Gibraltar and Malta, for instance, are mere fortresses, not affording a profitable emigration-field for the home population, but, on the contrary, requiring that such inhabitants of the United Kingdom as reside there shall be specially remunerated for doing so. The support of these dependencies is justified by the warlike, not the economic, policy of the country. On the other hand, territories have afforded profitable residences to the people without being colonies; the most conspicuous of this class is the British empire in Hindustan, where the British residents scarcely concern themselves in the occupation of agriculture, from which the term colonist is taken; but reside as the rulers and defenders of the native races. The ancient migrations of nations, by which Great Britain, for instance, became peopled apparently in the first place by Celts, and next by Teutons, were not colonization in the fullest sense of the term, since the parent-country kept no control over the settlers, and afforded them no protection. The Greeks were a spreading people, carrying with them their genius and their language. They established communities in Asia Minor, on the coast of Africa, in Italy and in France, for instance, Marseilles was a Greek town, founded by the inhabitants of Phocæa about six centuries before the Christian era. A close connection was maintained between these emigrant communities and the states from which they had removed. Still, however, none of these districts were colonies, according to the definition given above; and it was one of the many triumphs of the organizing genius of the Romans, to form the "C." according to its most perfect modern acceptation. The principle of responsibility to a central government was brought to its greatest perfection in the policy of Rome, and it was part of this policy that not only every conquered territory, but every district where Roman citizens settled, should be an integral part of the empire. The *colonia* was one of the municipal institutions of the empire, having its own governing corporation dependent on Rome. There were various grades of colonies—some where there was the high privilege of Roman citizenship, and others where the citizenship was of a humbler grade. Corresponding with the consuls in Rome, there were municipal officers in the colonies, representing, after the empire was formed, the old republican institutions —these were called sometimes *duumviri*, and sometimes *quatuorviri*—terms, the special application of which has been matter of considerable discussion. The Romans appointed men of very high rank to the government of their provinces or colonies—men who had held such offices as the consulship or prætorship at home, and were called proconsuls or proprætors. It was a feature of the sagacious jealousy of the Roman system, to limit their period of government, lest they should become independent of the empire, and estab-

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lish separate states; and this idea is followed in the colonial system of the British empire at the present day.

After the fall of Rome, centuries passed before colonization recommenced; for the various tribes who devastated the empire were not connected with any parent state, and the Normans, who spread themselves over Europe at a later period, were utterly unconnected, in the countries where they settled, with the government of the northern states whence they migrated. It is curious that not a trace of the genealogy of the Normans of England or France can be found anterior to their settlement in the latter country, so little connection did they preserve with the country of their ancestors. The Spanish and Portuguese were the first among modern European states to establish colonies. Portugal was first in the field, establishing settlements along the western coast of Africa in the 15th century, and, after 1486, Bartholomeo Diaz having rounded the Cape of Good Hope, she extended her settlements along the eastern coast and into India, finally penetrating to the islands of the Pacific. The Spanish king aimed not only at the restoration of the Roman empire in Europe, but at the creation of a new empire in America, which was looked on as the exclusive property of the Spanish crown. In carrying out this view, it was not so much that the people of the peninsula went to America, and had the necessary staff of civil and military officers sent to them by the parent state, as that great officers, with high rank and enormous salaries, were sent over to the new empire, and brought followers after them. Neither Spain nor Portugal followed the policy of developing the natural resources of the regions which they occupied, but merely used the colonies as a basis of profitable trade with the home country. Portugal established mere factories for the exchange of native products for the manufactured articles of the home country. This system was productive of serious abuses, for, fearing lest the colonial authorities should acquire independence, rotation in office was adopted. The result of this was that each colonial governor was apt to use the advantages of his office for the purpose of enriching himself. A short tenure compressed a great deal of peculation into a brief period. The Spanish colonies were chiefly concerned in mining and gave no attention to agriculture. They were governed by an official hierarchy, under the general direction of an executive department in Spain. The Spanish colonists showed much cruelty toward the natives, and the inquisition was introduced in South America. The other governments of Europe — Britain, France, Holland, and the minor states — subsequently colonized in America and Africa, Denmark occupying the inhospitable shore of Greenland.

The earlier British colonies arose in the reverse order to those of Spain—the colonists went first, the dignitaries followed. This was especially true of the New England colonies. In Virginia the case was different, for the colony there, in 1607, consisted of gentlemen, adventurers, people of no occupation, and without families. There were only a few laborers and mechanics in the expedition, and the members of it were ill-fitted to encounter the hardships of the new world. As a result, disease carried off about one-half of the settlers during the first summer. The previous attempts of Raleigh and Drake to form settlements in the new world had also been unsuccessful, and it was only after the colonists had learned many severe lessons, that they were able to thrive. Before the end of King James's reign, however, the British race had gained a firm foothold in America. The settlers were privileged companies, with royal letters-patent, but in reality they were independent; and as they were dissenters seeking a place of refuge from what they considered the grievances of the established church and the government, they took care not to convey the grievance with them, as they would have done had they been actually incorporated with the British empire. The northern colonists, indeed, acted as if they were a sort of private corporation. The policy of Great Britain toward her American colonies was the result of the accepted economic philosophy of the times (see POLITICAL ECONOMY), according to which it was thought that the trade with the colonies must be strictly confined to the home country. The idea was that the colonies should supply raw materials to the mother country, and in return should purchase from the latter its manufactured products. Shipping was to be in the hands of the home country. This policy was no more characteristic of England than of other European states, and the reason why it encountered such vigorous opposition in the American colonies, was because the latter had a more energetic and independent spirit from the first, than the colonies of Spain, Portugal or France. By the navigation act of Cromwell's time the commerce of England with the colonies was exclusively reserved for English vessels. This act was modified from time to time, but it was not until the early part of the 19th century that it was replaced by a new law. The loss of her American colonies was a severe blow to her colonial system, for her colonies up to that time had been so numerous and near together, that by trading with one another they could be nearly independent of foreign supplies, but the independence of the North American colonies left them without the means of gaining the necessary articles for consumption, from colonial sources. Eventually the restrictions on their trade were repealed. Despite the loss of the American colonies, England rose in the 18th century to the first rank of colonizing nations. In the 17th century Spain, which up to that time had been the greatest colonial power in the world, began to decline, and her power steadily sank until, in the early part of the 19th century, she lost her colonies in South America. From that time to the present, England has had the greatest colonial empire in the world. In the 19th century the great field of colonization has been Africa (q.v.). See also the articles on the various European countries for further accounts of their colonies.

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COL'OPHON, an Ionian city of Asia, about 9 m. n. of Ephesus, and near the sea-coast. The river Ales, noted for the coolness of its water, flowed past it. It is not often mentioned in history, although the birthplace of several poets, Mimnermus, the elegist, among others, and even claiming to be the native city of Homer. The Greek proverb, "to put the colophon to it," meaning to terminate an affair, is said to have originated in the boast of the famous Colophonian cavalry, that their *charge* was usually the finishing stroke in battle. Hence, in old printed books, the conclusion, in which were stated the name of the author, and the place and year of printing, was called a colophon.

COL'OPHONY. See ROSIN.

COLOQUIN'TIDA. See COLOCYNTH.

COLOR, in art, means either the pigment employed to produce a certain effect to the eye, or the effect thus produced, i.e., the tint of a picture. In the former sense, it is treated of in this work under the names of the colors themselves. See CARMINE, CHROMIUM. In the latter sense, C. must be regarded by the artist not so much as the result of the application of one or more pigments separately, as of their use in the innumerable combinations of which they admit.

Recent investigation tends to regard as simple or primary colors, *red, green*, and *violet*. It is found impossible to resolve red, green, and violet (or blue) light into any other colors; whereas a yellow ray may be resolved into red and green, or compounded by mingling red and green light. But in popular acceptation, as in the scientific works of Brewster and others, the primaries are *red, blue* and *yellow*. See SPECTRUM, LIGHT, etc. Compounded in various proportions, either in twos, or all three together, these three colors produce every hue in nature or in art, every tint that is physically possible. First, when combined in twos, they produce the three *secondary* colors—that is to say, blue and red make purple or violet; yellow and red, orange; blue and yellow, green. The grays and browns, again, are compounds of all three of the primary colors, in unequal and varying proportions.

COMPLEMENTARY COLORS are the colors or color which, with any color or colors mentioned, make up the three primary colors, which constitute white light. Thus, if the given C. be a primitive, its complementary C. is composed of the other two primitive colors; e.g., the complementary color of blue is orange = red and yellow. Again, if the given C. be a secondary, its complementary C. is the remaining primitive color Thus, the complementary C. of green—blue and yellow—is red.

CONTRAST OF C. is either simple or compound. Each of the primitive colors forms a simple contrast to the other two. Thus, blue forms a simple contrast to red and to yellow. But if red and yellow be mixed together, the complementary C. to blue will be produced—viz., orange, which is the most powerful contrast that can be made to blue.

HARMONY OF C. consists in the preservation of the same character in a picture throughout, in so far as coloring is concerned. It is said to result from an equal distribution of the three primary colors, either pure or in composition; but such a rule, even if correct, is correct with so wide a latitude as scarcely to admit of practical application. The only method of attaining to a knowledge of harmony of C., is to train the eye by the observation of it as exhibited in nature. A southern sky will be found to harmonize with a southern landscape, and consequently, the colors of which the one is composed with those which compose the other. The experiment may be made by painting an Italian sky over an English landscape, when the want of harmony in the coloring will be at once apparent. The art of preserving harmony without sacrificing variety, resembles that of preserving light in shadow, and combining clearness with depth, which we have explained under CHIAR-OSCURO.

WARM AND COLD COLORS are terms derived from the corresponding sensations which they are supposed to produce. Blue is said to be a cold C., and orange a warm one, whereas red is neither warm nor cold. Without supposing color-blindness, however, it seems very possible to imagine that in this respect the same C. may, from association and other causes, produce different sensations on different persons.

A COLORIST is an artist in whose works success in color is the prominent excellence. The greatest colorists are Titian, Correggio, Paul Veronese, Rubens, and perhaps his pupil Vandyck. To say that these artists surpass Raphael, or even Leonardo da Vinci, in this respect, would probably be to say too much. But that they equal these greater artists in this, and in this respect alone, is a sufficient reason for their being known as colorists *par excellence*. The art of coloring admits of being transmittted to pupils to a greater extent than the highest branch of all.

COLOR, in optics. See LIGHT, CHROMATICS, SPECTRUM.

COLOR, a rhetorical term, which was adopted into the technical language of English pleading. Previous to the passing of the common law procedure act of 1852 (15 and 16 Vict. c. 76), it was a rule that pleadings in confession and avoidance, as opposed to pleadings by way of traverse, should confess the matter adversely alleged, to the extent at least of admitting some apparent right in the opposite party requiring to be encountered and avoided by the allegation of new matter. This was called giving C. to the

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plaintiff's claim. All this curious subtilty, to which English lawyers till recently were in the habit of attaching so much value, was very properly set aside by the statute above referred to. This section which applies to *C.* is the 64th.

COLOR, in Heraldry. The colors used are generally red, blue, black, green, and purple; which are called gules, azure, sable, vert or sinople, and purpure. Tenne or tawny, and sanguine or blood-color, sometimes occur, but they are not common. Yellow and white, again, are not colors in the heraldic sense, but metals; they are called or and argent, and are always represented by gold and silver. It is a fundamental and invariable rule in blazon, not to put C. upon C., or metal upon metal; thus, if the field be of a metal, the bearing must be of a C., and *vice versâ*. The only exception is said to be the arms of Jerusalem, which were given to Godfrey of Bouillon, which are *argent, a cross potence or, between four crosslets of the same.* Apparent exceptions to this rule in common blazon are—1. Abatements or marks of cadency or difference, labels, crescents, batons, and the like; and 2. Extremities or adjuncts to animals, or other objects, such as tongues, claws, horns, etc.; but neither of these are regarded as independent bearings. Colors and metals, when engraved, are generally indicated by dots and lines: *or*, gold, by dots; *argent*, silver, is left plain; *gules*, red, is indicated by perpendicular lines from top to bottom; *azure*, blue, by horizontal lines from side to side; *sable*, black, by horizontal and perpendicular lines crossing each other; *vert*, by diagonal lines from right to left; *purpure*, by diagonal lines from left to right; *tenne*, by diagonal lines from left to right, crossed by horizontal lines; and *sanguine*, by lines crossing diagonally from left to right, and from right to left.

COLORADO, a Pacific highland state and the 25th in order of admission ; lat. 37° to 41° n.; long. 102° to 109° w.; bounded on the n. by Wyoming and Nebraska, on the e. by Nebraska and Kansas, on the s. by Oklahoma Terr. and New Mexico, on the w. by Utah; length from e. to w., 380 m., breadth, 275 m.; land area, 103,645 sq. m. or 66,332,800 acres.

HISTORY.—The C. river (the name meaning "red water"), gives the state its name, several tributaries rising within its limits. The region was partially explored in 1806 by Lieut. Pike, U. S. army, and in 1819 by Col. Long, from whom the two most prominent peaks received their names. Capt. Bonneville, of the American fur-trading company, followed in 1832, and further exploration was made by Frémont in 1842 and 1844. Before the Mexican war, fur-trading stations had been built on the Arkansas and Platte, but up to the close of the war, Mexico claimed all of what is now A., s. of the 41st parallel and of the Arkansas river. In 1854, colonists from New Mexico founded Conejos in the Rio Grande valley, and a Jesuit mission was soon established there. Settlements by Mexicans followed in the Los Animas valley. In 1858, gold was discovered in the n. part of C., and the towns of Denver. Auraria, Boulder, etc., came into existence. A territorial government was soon applied for; also representation in the Kansas territorial legislature. As a result of the second request the co. of Arapahoe was organized, including all of western Kansas and extending to the top of the Snowy range. In 1859, a large body of thrifty and intelligent emigrants came in; free schools were established, and on Apr. 23, the first newspaper, *The Rocky Mountain News*, was published. In this same year gold was discovered w. of the Rocky mountains, a stage line was established between the Rocky Mountains and the Missouri River, and a state constitution was drafted and submitted to the people. Its rejection led to an attempt to form the territory of Jefferson.

In 1861, Feb. 26, the territory of C., with its present limits, was organized, and divided into 9 cos. From 1864–70 there were wars with the Cheyennes and Arapahoes. The Utes, always friendly, ceded the mountain and park regions between 1868 and 1878. In July, 1864, a constitution was framed at Denver, but was rejected. In 1868, and again in 1874–75, movements toward obtaining admission were made. The enabling act was passed by congress, Mar. 3, 1875. In the winter of 1875–76, a constitutional convention met, and a second constitution was framed, which was adopted July 1, 1876, by a vote of 15,430 to 4053. The state was admitted Aug. 1. State officers were chosen Oct. 3, and in Nov., the first legislature, consisting of 47 representatives and 26 senators, met at Denver. C. is sometimes called "the centennial state" in allusion to the year in which it entered the union.

TOPOGRAPHY.—C. forms a conspicuous part of the great watershed of the continent, lying as it does, on both sides of the Rocky Mountains. Its mean height above the sea is 7000 ft., and its eastern border (its lowest part) varies from 3000 to 3500 ft. The Rocky Mountains cover a little more than one half of the surface and are known by various names. The Saguache or Sawatch range, the great divide, a continuation of the Sierre Madre, of Mexico, contains among its peaks, Mt. Harvard, 14,375 ft. high, Mt. Elbert, 14,351 ft., and the impressive Mountain of the Holy Cross, 14,176 ft. Connected with this are, in the n., the Park Range, with Mt. Gray, 14,341 ft. high, Mt. Irwin, 14,336 ft., and Long's Peak, 14,271 ft.; and in the s. the Sangre del Cristo range, with Blanca Peak, 14,464 ft. high, the loftiest eminence in the state. To the e. lies the Front Range, and many detached peaks, such as Evans, 14,330 ft., and Pike's, 14,147 ft.; westward are innumerable spurs and broken chains, deviating from the general n.w. to s.e. direction of the greater ranges; among them the Roan Mountains, the Elk Mountains, and in

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the s.w. the Uncompahgre and San Juan mountains. The number of peaks in C. exceeding 13,000 ft., is about 100; of the passes, the Argentine is at an elevation of 13,100 ft. High table lands of great extent occupy much of western C. The great valleys or parks enclosed by the mountains are a distinguishing feature of the scenery. Four are widely celebrated for their size and beauty, and are named the north, middle, south and San Luis parks. The second has an area of 3000 sq.m., and an elevation of 8500 ft., the third an area of 2200 sq.m., and a general elevation of 9500 ft.; while the last named, and the largest, contains 8000 sq.m. (the most level land in the state, though elevated 7500 ft.), a fertile soil and a delightful climate. Of the large rivers having their sources in C., the North Platte and South Platte unite to form the Platte of Nebraska; the first named, after a circuitous course, through Wyoming. The source of the South Platte is 11,176 ft. above tide and its fall in the short distance to Denver is 6000 ft. The Arkansas rises 10,176 ft. above the sea, in the w. central part of the state, rapidly falls to 78,777 ft. and flows s.e. and e. into Kansas, passing in one place through a cañon from 1000 to 1500 ft. deep. The Rio Grande del Norte rises in the Saguache range and flows through San Luis park into New Mexico. The largest streams on the w. are the Yampah, and White, tributary to Green River of Utah; the Grand, one of the main tributaries of the Colorado and its affluents, the Gunnison, Dolores, and San Miguel. None of these streams are navigable. The only lake of consequence, San Luis, about 60 m. long and a quarter of a m. wide, lies in San Luis Park, and receives nearly 20 streams, but has no visible outlet. The Chicago Lakes have an elevation of 11,500 ft.

The lofty peaks and deep-lying parks are equalled in grandeur by the river cañons; those of the Arkansas, Grand, Gunnison, Little Colorado and Uncompahgre varying in depth from 1 to 3000 ft. "The Garden of the Gods" and "Monument Park" are filled with castellated buttes or "mesas" that rise out of green meadows, or with grotesquely shaped pillars and towers, carved by erosion. A large area in Saguache co. has been reserved as a state park.

Geology.—Azoic and eozoic rocks compose the mountain region, bordered on the e. and s.w. by palæozoic formations. Metalliferous, Jurassic, and Triassic strata occur next to the palæozoic, and appear in the w. central part of the state in a narrow belt extending into Wyoming. The eastern plains and the parks are largely tertiary, as is the n.w. corner. The sedimentary rocks at the base of the Front range have an estimated thickness of 7000 ft. The s.w. is chiefly cretaceous, and many river valleys exhibit this formation or are wholly of it; the Arkansas and South Platte, for instance.

The lava beds of Utah extend across the western boundary. In few states are the results of glacial action so conspicuously seen; the valley of the Arkansas, in particular, having been occupied by a glacier of great depth as its terminal moraines show.

Mineralogy.—Gold, silver, iron ore of many kinds, and coal are the most important minerals, and in addition are found lead, zinc, copper, platinum, quicksilver, salt, gypsum, pottery clay, kaolin, tellurium, combined with other ores, sulphur, gray and mottled granite, white and variegated marbles, sandstone for building, petroleum and natural gas. The coal-bearing rocks belong mainly to the upper tertiary system, and cover an officially estimated area of 40,000 sq. m. The seams have an average thickness of 5 ft., and are rarely, if ever, deeper than 30 ft. Lignite, anthracite, and bituminous coals abound, and the coal of the s.w. cos. is equal to that dug in the Mississippi Valley. In 1886, Gilpin co. produced the most gold; Lake co. the largest supply of silver, lead, and copper.

Zoölogy.—The wild animals include the grizzly, black and brown bear, panther, gray wolf, prairie wolf, elk, mountain sheep, Virginia and mule deer, antelope, beaver, badger, prairie dog, mink, and marten; the birds and water fowl, the golden eagle, wild turkey, wild goose, sage hen, prairie chicken, crested jay, towhee finch, kill-deer, great horned owl, burrowing owl, red-shafted woodpecker, and meadow lark. Among fish are the brook and rainbow trout, and landlocked salmon and German carp have been introduced. The state breeding pools are near Denver.

Botany.—The forests are confined to the mountain ranges and high valleys of the western half of the state, those of the greatest importance occurring at an altitude of from 10,000 to 12,500 ft. Next come tracts of red fir and yellow pine extending to the foot-hills, where the nut pine and western juniper abound. Along the streams and through the cañons are found willows, cherries, cottonwoods and other deciduous trees. The quaking aspen and lodge-pole pine are common on the high lands. The plateaus of the s.w. are treeless, or covered with a thin growth of juniper. Other trees are the ash-leaved maple, paloverde, mountain mahogany, scrub oak, wild plum, locust, tamarack, balsam, white fir, and Spanish bayonet. Among flowering plants are the blue anemone, vetch, pentstemon, lupine, gilia, phlox, purple clematis, harebell, shooting star, mertensia, coreopsis, mentzelia, larkspur, poppy, abronia, kinnikinnick, saxifrage, and yellow lady's slipper.

Climate.—C. has a remarkably regular and salubrious climate. The days are sometimes hot, but the nights are cool and without dews. The cold, except on the heights, is seldom severe, and it is rare to find the mercury down to zero. Snows are heavy and lasting on the mountains, but in the lower levels are seldom deep, and very soon melt away. The dry atmosphere is so pure, that fresh meats are preserved by the simple process of drying. The late summer is almost rainless. Frosts occur early in the

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AREA AND POPULATION OF UTAH AND COLORADO BY COUNTIES.

(ELEVENTH CENSUS: 1890.)

UTAH.

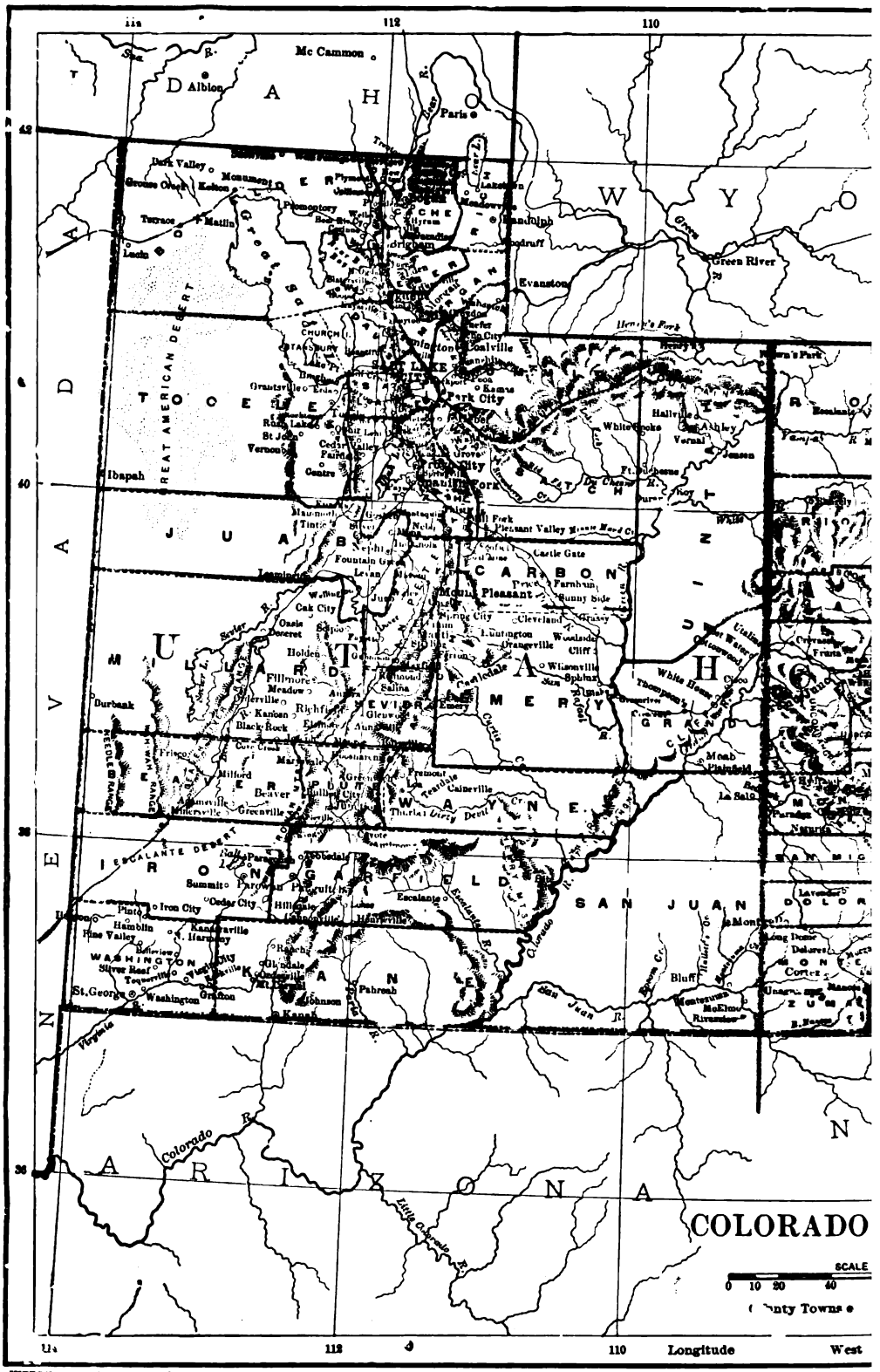
	Area in Square Miles.	Population.		Area in Square Miles.	Population.
Beaver	2,704	3,340	Salt Lake	784	58,457
Box Elder	7,016	7,642	San Juan	9,178	365
Cache	1,090	15,509	Sanpete	1,784	13,146
*Carbon	.....	.....	Sevier	1,872	6,199
Davis	290	6,751	Summit	3,062	7,733
Emery	5,723	5,076	Tooele	6,240	3,700
Garfield	1,364	2,457	Uintah	5,834	2,762
Grand	3,175	541	Utah	1,986	23,768
Iron	3,436	2,683	Wasatch	3,444	3,595
Juab	3,828	5,582	Washington	2,446	4,009
Kane	4,172	1,685	*Wayne	....	.....
Millard	6,712	4,033	Weber	650	22,723
Morgan	725	1,780			
Pi Ute	3,695	2,842	Total	82,190	207,905
Rich	980	1,527			

COLORADO.

	Area in Square Miles.	Population.		Area in Square Miles.	Population.
Arapahoe	5,220	132,135	Larimer	4,100	9,713
Archuleta	1,100	826	Las Animas	4,700	17,208
Baca	2,300	1,479	Lincoln	2,600	689
Bent	1,500	1,313	Logan	1,830	3,070
Boulder	790	14,083	Mesa	3,000	4,260
Chaffee	1,150	6,613	*Mineral	.....	.....
Cheyenne	1,800	534	Montezuma	2,640	1,529
Clear Creek	390	7,184	Montrose	2,300	3,980
Conejos	1,200	7,193	Morgan	1,290	1,601
Costilla	1,720	3,491	Otero	2,050	4,193
Custer	720	2,970	Ouray	450	6,510
Delta	1,150	2,534	Park	2,100	3,548
Dolores	1,000	1,498	Phillips	570	2,642
Douglas	840	3,006	Pitkin	950	8,929
Eagle	1,600	3,725	Prowers	1,650	1,969
Elbert	1,880	1,856	Pueblo	2,400	31,491
El Paso	2,660	21,239	Rio Blanco	3,600	1,200
Fremont	1,600	9,156	Rio Grande	1,260	3,451
Garfield	3,250	4,478	Routt	6,000	2,369
Gilpin	150	5,867	Saguache	3,240	3,313
Grand	2,100	604	San Juan	500	1,572
Gunnison	3,200	4,359	San Miguel	1,300	2,909
Hinsdale	1,400	862	Sedgwick	650	1,293
Huerfano	1,600	6,882	Summit	690	1,906
Jefferson	860	8,450	Washington	1,080	2,301
Kiowa	1,800	1,243	Weld	4,075	11,736
Kit Carson	2,150	2,472	Yuma	1,180	2,596
Lake	450	14,663			
La Plata	1,860	5,509	Total	103,645	412,198

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autumn and late in spring. The yearly mean temperature at Fort Garland in the extreme s. is 42.86°; at Denver, the mean temperature in July is 74°; in Dec. 28°. The climate and air of C. are considered to be of great benefit to asthmatic and pulmonary sufferers, and the charming parks are likely to become the great natural sanitaria of North America. The various mineral springs are also adjuncts to the remedial nature of the climate. The Great Pogosa on the s. side of San Juan river is situated at an altitude of 7084 ft. The hot sulphur springs of Middle park and Wagon-wheel gap, the hot springs of Cottonwood, and the hot, iron, and soda springs of Manitou, Cañon creek, and Idaho are popular resorts.

AGRICULTURE.—Originally not more than one third of the state was adapted to agriculture, but the available area has been greatly increased by irrigation, and large tracts, apparently sandy wastes, have been made to rival the plains and parks in fertility. Fully $10,000,000 have been spent in the construction of canals and ditches, of which over thirty thousand miles are in operation. The Platte Canal, which takes its supply from the South Platte, has a total length, including branches, of eighty-three miles, and irrigates about sixty thousand acres. The Larimer and Weld Canal takes its water from the Cache à la Poudre River, is fifty-four miles long, and irrigates over one hundred thousand acres. The state is divided into five water divisions, each under a superintendent; these divisions are subdivided into districts, each under a commissioner, and over all is a state engineer. The aggregate annual production amounts to over $12,000,000, and includes the leading cereals, dairy products, potatoes, honey, all kinds of vegetables, berries, and the hardy fruits. Alfalfa is becoming a leading crop, the annual yield reaching three million tons. Natural grasses are abundant and luxuriant, and in most parts pasturage lasts through the winter. The cereal products of 1896 were valued at $3,672,363; potatoes, $1,337,789; hay, $10,424,254. Farm animals were valued at $26,369,441, including cattle $18,044,569, sheep $2,486,290, and horses $3,204,212.

INDUSTRIES.—The principal manufactures are flour, foundry and machine-shop products, malt liquors, lumber, saddlery and harness, and meats, The most important industries, however, are mining and the smelting and reduction of ores. Gold was discovered in 1858, and the output in 1895 exceeded that of California, giving Colorado first place as a gold-producing state. For the first time in the history of the state, the output of gold exceeded in value that of silver, and the increase was due to remarkable developments at Creede and Cripple Creek, and to increased activity at Leadville. The value of the precious metals mined in that year was gold, $17,340,495; silver, $14,259,049; lead, $2,955,114; and copper, $877,492. Pueblo is the seat of numerous foundries, and rolling mills, steel and lead works; Trinidad has important iron manufactures and large quarries; Central, in the midst of rich gold mines, has large quartz mills and factories of mining machinery; Golden and Boulder, mines and manufactures; Colorado City, extensive gypsum beds; Lyons, Ft. Collins, Calumet, and Hancock, quarries of granite, marble and sandstone; coal at New Castle and Glenwood Springs, petroleum at Florence.

RAILROADS.—The Union Pacific, Missouri Pacific, Atchison, Topeka, and Santa Fé, and the Denver and Rio Grande, with their branches, are the principal railroad systems in the state. The total mileage is nearly five thousand. The Rio Grande ascends one peak at the rate of over two hundred feet to the mile; and it passes through the Arkansas River cañons on rocky ledges made by workmen suspended by ropes while blasting the solid rocks.

BANKS.—On Oct. 31, 1896, there were 43 national banks in operation, with capital, $6,537,000, circulation, $1,415,422, and deposits, $25,432,054; 31 state banks with capital, $1,885,000, and deposits, $3,622,128; and 10 private banks with capital, $351,800, and deposits, $723,952. The exchanges at the clearing-house at Denver in the year ending Sept. 30, 1896, aggregated $128,834,504.

CHURCHES, EDUCATION, ETC.—The leading denominations numerically are the Roman Catholic, Methodist Episcopal, Congregational, Baptist, Protestant Episcopal, and Presbyterian. There is an excellent public school system with — number of children of school age, over 114,000; enrolled, over 90,000; average daily attendance, over 60,000. The estimated value of all public school property is over $6,000,000. Women are eligible to school district boards and may vote at school elections. There is a Normal school at Greeley. Higher institutions of learning are, Colorado college, established at Colorado Springs in 1874; University of Colorado, opened in Boulder in 1877; school of mines at Golden, and school of agriculture at Fort Collins; Presbyterian college at Del Norte and Denver University; also Rocky Mountain University and College of the Sacred Heart at Denver. Wolfe Hall and Jarvis Hall are prominent private schools in Denver. There are medical schools at Boulder and Denver. The national government has an Indian school at Junction. There are over 280 newspapers and periodicals published. There are over 30 public libraries, aggregating more than 125,000 volumes. State institutions are the industrial schools at Denver and Golden; insane asylum at Pueblo, and penitentiary at Cañon City.

GOVERNMENT, ETC.—The capital is Denver. A residence of six months in the state, ninety days in the county, and ten days in the township, village, or ward entitles one to vote. Elections are held biennially on the Tuesday succeeding the first Monday in November. Senators (thirty-five) are elected for four years; representatives (sixty-five) for two years. Legislative sessions are held biennially, and members receive $7 per day

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and 15 cents per mile traveled. The state officers are elected for two years. The gov. receives $5000 salary; the sec. of state, treas. and supt. public schools, $3000 each. There are three judges of the supreme court and three commissioners, each serving nine years, with salary of $5000. There is a court for each of the nine judicial districts, a criminal court in several cos.; a co. court in each co.; also a superior court for Denver City. The legal rate of interest is 8 per cent. There are no usury laws. Registration of voters is required. New ballot laws, based on the Australian system (q. v.), were adopted in 1891. In the state elections in 1893, the people voted in favor of woman suffrage.

The authorized strength of the state militia is 2861 men, apportioned between infantry, cavalry, and artillery. The annual appropriation exceeds $30,000, and the total available force for military duty is 85,000.

C. has two senators and two representatives in congress. The electoral votes have been cast as follows: 1876, Hayes and Wheeler; 1880, Garfield and Arthur; 1884, Blaine and Logan; 1888, Harrison and Morton; 1892, Weaver and Field; 1896, Bryan and Sewall.

FINANCES.—The last United States census reports give the total assessed valuation as $188,911,325; per capita, $458.30. The state debt, $599,851; county debt, $4,601,588; municipal debt, $2,955,962; school district debt, $253,626; total debt less the sinking fund, $8,411,027. In 1896, the assessed valuation was over $208,000,000; net debt, $1,900,000.

POPULATION.—In 1860, 34,277; 1880, 194,327—612 Chinese, 154 Indians. Population, 1890, 412,198. The number of Indians in the state in 1890 was 1084. There are fifty-five cos.; for pop., 1890, see census tables, vol. XV. The largest cities, 1890, were Denver, 106,713; Leadville, 11,212; Pueblo, 24,558; C. Springs, 111,140; Boulder, 3330. See Fossett's *Colorado* (N. Y., 1880).

COLORADO COLLEGE, at Colorado Springs, Col., was founded in 1874, being the oldest institution for higher education in the Rocky Mountain section of the country. It has a campus of fifty-six acres in the centre of the city. Its courses of study correspond to those of the best Eastern institutions. It has ten buildings, large geological collections, and its library, which cost $50,000, has 26,000 volumes. In 1897, its students numbered 297, drawn from all parts of the country. Its faculty, 1897, consisted of 33 instructors. Its associated preparatory school, Cutler Academy, fits for any American college. William F. Slocum, LL.D., President.

COLORADO, a co. in s.e. Texas, on the C. river, reached by the Southern Pacific railroad; created, 1836; organized, 1837; 960 sq. m., pop. '90, 19,512, includes colored. The region is fertile and heavily wooded; productions: corn, cotton, sweet potatoes, etc. Co. seat, Columbus.

COLORADO RIVER, in Texas, rising near the New Mexican boundary and flowing s.e. through nearly the whole breadth of the state, emptying into Matagorda bay. It is about 900 m. long. and in winter is navigable by steamboats to the city of Austin.

COLORADO, or COBU LEUBU, **RIVER**, rising in the Andes, and flowing s.e. through a portion of the Argentine republic to the Pacific. It is about 600. m. long.

COLORADO RIVER, or COLORADO OF THE WEST, a large river rising in Utah, and flowing, s. and w., through Utah and Arizona, and between Nevada and California and Arizona. The C. is formed by the junction of the Green and the Grand Rivers of Utah in lat. 38° n. The main tributaries of the C. are from the e., and include the San Juan, the Little Colorado and the Gila. After leaving U. S. territory, the C. flows s. between the Mexican provinces of Lower California and Sonora, and discharges its waters into the extreme n. point of the Gulf of California. The length of the C., reckoning from the sources of Green River, is about 2000 m. It is navigable for steamers a little over 600 m., nearly to the foot of the Grand Cañon. There is a good harbor near the mouth of the river, used mainly by vessels in the C. trade. The remarkable features of this river are its cañons, which extend for more than 500 m. along its course. The most notable, and in itself a great wonder, is more than 200 m. long, with walls quite or nearly vertical, varying from 4000 to 7000 ft. high. The channel of the river is in some places 100 yds. wide, and then perhaps suddenly narrowed to less than 20 yds. The fall of the stream is from 5 to 200 ft. in a m., and the deep, gloomy gorge is full of whirlpools and waterfalls. See illus., GEOLOGY, vol. VI.

COLORADO SPRINGS, city and co. seat of El Paso co., Col.; on the Denver and Rio Grande and several other railroads; 75 miles s. of Denver and about 10 miles east of Pike's Peak. It is on Fountain Creek and is 6000 feet above the level of the sea. It is a fashionable summer resort, having a mild, healthy climate, beautiful scenery, and valuable medicinal springs. This city has several hotels, churches, Colorado College, the Childs-Drexel Home for union printers, saw-mills, a public-school building costing $22,000, state school for deaf-mutes, state asylum for the deaf and blind, national and state banks, electric railroad, etc. Pop. '90, 11,140.

COLOR-BLINDNESS, a term introduced by Sir David Brewster to denominate a defect of vision, owing to which certain persons are either unable to discern a single color, such as red, or to distinguish between two colors, such as green and red, so that they may be said to be blind to red, or to be blind to one of two colors presented simultaneously to the eye. This defect has been called *chromatopseudopsis—i. e.*, false vision of colors: Daltonism, after Dalton the chemist, who suffered under it, and various other

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learned names have been applied to it; but color-blindness seems to be as apt and expressive a name as any. It occurs in eyes whose power of vision, as to form and distance, is otherwise perfect. The late Dr. George Wilson, whose work on this subject should be consulted by the reader (*Researches on Color-blindness*, Edin. 1855), thus classifies the varieties of the defect: 1. Inability to discern any color properly so called, so that black and white—i.e., light and shade—are the only variations of tint perceived. 2. Inability to discriminate between the nicer shades of the more composite colors, such as browns, grays, and neutral tints. 3. Inability to distinguish between the primary colors, red, blue, and yellow, or between these and the secondary and tertiary colors, such as green, purple, orange, and brown. The first sort would appear to be very rare, but well-marked cases of it are on record, and show that insensibility to colors is not only compatible with distinct vision in other respects, but is frequently attended by a greater power than is usual of perceiving objects very faintly illuminated. None of these recorded cases, however, have been examined with such care as to warrant the conclusion that the color-blindness was absolute. It would appear that where the color-blindness is nearly absolute, degrees of luminosity supply the place of shades of color in giving variety to the aspects of objects. The second variety of color-blindness, where the nicer shades of the more composite colors are mistaken, would appear to be very common—the rule rather than the exception in the majority of persons, at least of the male sex, in this country; but it is a matter of doubt how far it may not be referable to imperfect cultivation of the sense of color. In many cases of this kind, however, it can be shown that the defect differs in degree only from that of the third form. The third form is the most important variety of the affection. In extreme cases, although colors are occasionally quite correctly named, there is no certainty as to any color: in less severe cases, two colors, at least, as red and green, and generally four, as red, green, olive, and brown, are not distinguished from each other. Yellow would appear to be the color which gives least difficulty to those not absolutely unconscious of color; while blue, if pure and well illuminated, is readily recognized by the color-blind, a few of whom, indeed, describe it as the color which they see best. Red appears to be the color the want of the sense of which may be said to characterize all the color-blind. Indeed, Dr. Wilson thinks color-blindness might properly enough be called *anerythric* (no-red) vision. He says that while the normal eye analyzes white light into three colored elements, one of which is *red*, the color-blind eye, on the other hand, analyzes white light into two elements, neither of which is red.

The eyes of persons having this defect of vision have been carefully examined after death without the discovery of any peculiarity. Color-blindness therefore has its seat in the sensorium, not in the visual apparatus.

A case is recorded where a physician diagnosed a case of scarlet fever in a child, and gave improper treatment. An experienced nurse protested, and, carrying her point, the child's life was saved. The physician had never seen scarlet. Next to the physician, the chemist ought to be absolutely correct in his color vision. If drugs, as they often do, change color, it indicates deterioration, and the chemist should be able to note the changes, no matter how slight. The nurse is alike disqualified for the same reason. The sailor whose color-blindness reads the starboard for the port light of a vessel sighted in the night, runs the risk of causing a terrible calamity. Among railway signal-men and engineers, it is a matter of the utmost importance. Shortly after the demonstrations of the scientists in Europe, of the dangers of transportation to persons and property on land and sea, from color-blindness, the attention of the railways of America was called to the subject. The magnitude of a new work began to be felt, and the Pennsylvania Railroad, with 50,000 employés and 5000 miles of track to be protected, and with ten or twelve thousand men actually dependent upon signals of color for their guidance, determined on a systematic examination of not only every man on the force, but every applicant for a position. Dr. William Thompson, of the Jefferson Medical College, was selected for the work, but inasmuch as his examination for the color-sense of each man, would consume years of time, a method was devised that secured the confidential co-operation of the employés. The system adopted was applied locally to each division, at the convenience of the men, and without compelling them to lose much time. All undue publicity was avoided, but the color-blind were marked, and when capable in other respects, transferred to other departments. An appeal lay to the surgical expert, and, after his decision, the man, generally retained in the service, was placed were his color-defect could work no harm. On the Reading Road, with 42,000 employés, on 3000 miles of track, out of 25,158 men examined, it was discovered that 481 of the number could not distinguish the color *red* from *green*, while 661 were more or less defective in their vision. Many railroad accidents have occurred in the past, where the sworn testimony of engineers, and yard-men, and switch-men, regarding the signals, has been so conflicting as to involve the accidents in a strange mystery. But it is now thought, and decided, by railway officials, that, where the men were above suspicion, the accidents were the result of color-defect in the eye-sight.

The question has received serious legislative attention, and in most of the states in the Union, stringent laws have been passed regarding the examination of the vision of all who depend on colors for their guidance. It is a crime in a color-blind person to pursue any calling when their defect, known to them, is liable to injure others, and it

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might be added that it is foolish for any painter, dyer, tailor, or milliner, to attempt to compete with those who have perfect vision.

COLOR-GUARD, in the infantry, is a guard of seven corporals and the color-sergeant in each regiment. It is posted on the left of the right centre company in the line.

COLOR HEARING, the vision of certain colors accompanying the perception of music or noise. There is no rule associating notes and colors; the seeming association varies with different experimenters. It is asserted that chords cause the perception of a combination of colors. One musician assigned a color for each key; e. g., blue for A major, lead color for A minor, etc. The colors accompanying noises are, as perceived, generally of one type. A few persons claim a perception of colors accompanying the enunciation of letters and words; and that, conversely, the perception of the color suggests the sound; e. g., that a steady flame causes the perception of a certain combination of vowels and consonants, the latter changing with the flickering of the flame. Nussbaumer, Bleuler, and Lehmann have written on this phenomenon, which awaits further investigation.

COLORING, as a musical term, is applied to those passages and harmonic progressions in bravura airs affording the singer an opportunity of display. It is also applied to all grand harmonic combinations in orchestral compositions.

COLOR-PRINTING. See Polychrome Printing.

COLORS, The Diatonic Scale of. Sir Isaac Newton, when investigating the properties of light, discovered that the lengths of the spaces occupied in the spectrum (q.v.) by the seven so-called primary C., exactly correspond to the lengths of cords that sound the seven notes in the diatonic scale of music. Hence the phrase, *the diatonic scale of colors.*

COLORS, Military. See Flag, Standard.

COLOR-SERGEANT, in the army, is a non-commissioned officer of higher rank and better pay than the ordinary sergeants. There is one to each company of infantry; and the office is specially given to meritorious soldiers.

COLOS'SÆ, a populous city of ancient Phrygia, on the river Lycos. Its inhabitants were noted for their skill in dyeing wool. C. was almost entirely destroyed by an earthquake, 65 A.D. To the Christians of C., Paul addressed one of his epistles.

COLOSSEUM. See Amphitheater.

COLOSSIANS, EPISTLE TO THE, is proved by external testimony and internal evidence to be a genuine production of the apostle Paul, and as such has been universally acknowledged except by a few modern critics who oppose but cannot overturn the general judgment. From the epistle itself it is plain that Paul wrote it when he was a prisoner; but whether at Rome or Cæsarea has been strenuously debated. While the internal evidence is perhaps evenly balanced for each place, the testimony of tradition is decided that the epistle was written at Rome. If that view be correct, its date is about 62 or 63 A.D. Another question much disputed is whether or not the church at Colossæ was founded by the apostle Paul. On the negative side the chief argument is derived from Paul's declaration concerning his anxiety "for the Colossians, Laodiceans, and all who had not seen his face." From this the conclusion is drawn that the Colossians were a part of those who had not seen him. On the affirmative side it is urged: 1. In reply to the preceding argument, that Paul's language, may fairly be interpreted to mean that his anxiety was for the Colossians and Laodiceans who knew him, and for the great multitude in addition who had never seen him. 2. That as it is stated in Acts that Paul went through Phrygia twice, preaching the gospel and revisiting the disciples, it is not probable that he passed by Colossæ and Laodicea, two of its important cities. 3. That his friendship for many prominent Christians at Colossæ, the cordial relations which existed between him and the church there, and his intimate acquaintance with their affairs, almost require the supposition that he had introduced the gospel among them. The epistle was probably written to counteract certain false teachings and tendencies which had appeared in the church and were, as Neander thinks, a combination of oriental theosophy and asceticism with Christianity in the effort to obtain a deeper insight into the spiritual world and a nearer approach to purity and intelligence than simple Christianity could yield. Such an effort was especially natural in Phrygia, the land of mystic rites and magical superstitions; and it is remarkable that in the 4th c. the council of Laodicea found it necessary to forbid angel worship, which had held its ground in that region. But in Paul's day the errors were only beginning to spring forth, and he opposed them by showing that in Jesus Christ Christians have all that they require; that he is the image of the invisible God, exalted above the angels, the creator and upholder of all things; that all Christians are complete in him and will be presented by him perfectly holy and unblamable before God if they continue steadfast in the faith; that while the prescriptions of a mere carnal asceticism are not worthy of their regard, there are high principles which should guide their consciences, and important duties which should govern their lives. The epistle so closely

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resembles that to the Ephesians, in doctrine, style, and manner, that a careful comparison of one with the other will greatly promote a correct knowledge of both.

COLOS'SUS, a Greek word of unknown origin, used to denote a statue very greatly beyond the size of life. In English, the adjective colossal is used in a somewhat wider sense, to denote all statues which exceed the size of life, in however small a degree. Most statutes are thus colossal, though of colossi, very few have been erected in modern times. The "Bavaria" (q.v.) at Munich is perhaps the only very celebrated example. The colossal was the peculiar characteristic of Egyptian art, and innumerable colossi were raised in Egypt, mostly of the hardest stone, many of them 50 to 60 ft. in height. The most celebrated is the vocal statue of Memnon (q.v.) in the plain of Thebes, described by Strabo and Pausanias, and supposed to be identical with the more northerly of the two existing colossi on the w. bank of the Nile. But it was in the artistic world of Greece that the most famous colossi appeared: e.g., the bronze statue of Pallas Athene, on the acropolis of Athens, the plume of whose hemlet and the point of whose spear were landmarks to sailors between Sunium and Athens; another statue of the some goddess, of gold and ivory—the so-called Palladium in the parthenon at Athens; and the Olympian Jupiter, of the same material, the masterpiece of Phidias, who was also the author of the two statues just mentioned. Amongst the seven wonders of the old world, was reckoned the gigantic C. of Rhodes, representing Phœbus, the national deity of the Rhodians. It is said to have been commenced by Chares, of Lindus, a famous pupil of Lysippus, and terminated by Laches. They formed it of metal, which was cast in separate pieces, a process which lasted for 12 years, and was completed 280 B.C. Its height is doubtful—some making it 90 ft.; others 90 and even 105 cubits. It cost 300 talents. Sixty years after its erection, it was thrown down by an earthquake. The Romans imitated the Greeks in the erection of these gigantic structures. The statue of Jupiter upon the capitol, made from the armor of the Samnites, was so large that it could be seen from the Alban hills. Then there was the bronze statue of Apollo, of which what is supposed to be the head is now in the capitol; a bronze statue of Augustus, in the forum; a C. of Nero, executed in marble, of the enormous height of 110 or 120 ft., from which the contiguous amphitheater is believed to have derived the name of "colosseum;" an equestrian statue of Domitian, in the center of the forum; and many others.

COLOS'TRUM is the term applied to the first milk yielded after delivery. In differs very materially from ordinary milk, and generally appears as a turbid, yellowish, viscid fluid, similar to soap and water. When examined under the microscope, it is found to contain, in addition to the ordinary milk corpuscles (see MILK), peculiar conglomerations of very minute fat granules, which are hence known as C. corpuscles. The chief chemical difference between C. and milk is, that the former contains nearly three times more salts than the latter. It is probably this excess of salts that usually causes it to exert a purgative effect upon the new-born infant, and thus to remove the meconium (q.v.) which had accumulated in the fetal intestine.

COLPORTAGE (from Fr., *colporter*, to carry on one's neck, derived from the Latin, *collum*, neck, and *portare*, to carry), the hawking or distribution of religious publications, books, tracts, and periodicals, by carriers called *colporteurs*.

COLQUITT, a co., in s w. Georgia, on the Withlacoochee river; 550 sq.m.; pop. '90, 4794, inc. colored. The region is level, and the chief productions are agricultural. Co. seat, Moultrie.

COLQUITT, ALFRED HOLT, b. Walton co., Ga., 1824; graduated Princeton coll., N. J., 1844; was admitted to the bar, 1845; served in the Mexican and civil wars, rising to maj.-gen. in the confederate army; was elected gov. of Georgia, 1876; re-elected, 1880; and was elected U. S. senator, 1882; re-elected, 1889. Died 1894.

COLT. See HORSE.

COLT, SAMUEL, 1814–62; b. Hartford, Conn., where his father had a manufactory of silks and woolens. At the age of 16, Samuel ran off to sea and made a voyage to India, in the course of which he made a wooden model (said to be still in existence) of a revolving pistol, the forerunner of the "Colt's revolver." After the voyage, he applied himself to the study of chemistry, and lectured on that science in the United States and Canada. In 1835, he visited Europe and patented his invention in London and in Paris, and on his return secured American patents. In the same year, he founded the Patent Arms company for the manufacture of revolvers only. The scheme did not succeed, the revolver was not appreciated, and in 1842 the company became insolvent; no revolvers were made for five years; and none were to be had when Gen. Taylor sent from Mexico for a supply. The government then ordered 1000 to be made, and this commission was the foundation of the inventor's wonderful success. In 1848 he removed to Hartford; in 1855 a large armory was completed; and in 1856 the Colt patent fire-arms company was incorporated. In 1864 the armory was burned at a loss of over $1,200,000. Portions of the present building are leased to various corporations. C. was also the inventor of a submarine battery for harbor defense, and of a method of insulating submarine telegraph cables.

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COLTON, WALTER, 1797–1851; b. Vt.; graduate of Yale and Andover, and professor of moral philosophy and belles-lettres at Middletown, Conn. He was for many years a chaplain in the navy, and while in the service he gathered materials for *Ship and Shore in Madeira, Lisbon, and the Mediterranean; Visit to Athens and Constantinople; Land and Lee in the Bosporus and Ægean;* and *Notes on France and Italy.* He was on the Pacific station at the beginning of the war with Mexico, and in 1846 acted as alcalde of Monterey. He built the first school-house and started the first newspaper in California, and a letter of his to a Philadelphia newspaper made the first public announcement in the United States of the discovery of gold at Sutter's Fort. Some years later he returned to Philadelphia, and published *Deck and Port,* and *Three Years in California.*

COLT'S-FOOT. See TUSSILAGO.

COLT'S REVOLVER. See PISTOL, REVOLVER.

COL'UBER, a genus of serpents which, as defined by Linnæus, included an extremely miscellaneous assemblage of species, venomous and not venomous, agreeing only in the character of having a double row of plates on the under side of the tail. The venomous species are now excluded, not only from the genus C., but from the family *colubridæ,* of which it is the type. The serpents of this family are very numerous: it includes, indeed, about one half of all the known serpents in the world. Their geographic distribution is very wide, although they chiefly abound in the tropics. Some of them are terrestrial, and some arboreal in their habits, the latter chiefly natives of the tropical parts of Asia and America. A few are inhabitants of fresh waters, and feed on fish. They are active in the pursuit of their prey, some of them feeding chiefly on small birds and quadrupeds, some on insects. They do not kill their prey by constriction, like the boas. Some of them are singularly and brilliantly colored. A few, particularly of the arboreal species, are remarkable for their extremely lengthened form. None of them grow to a very large size. To this family belong the common ringed snake (*natrix torquata*) of England, the only British species. To the genus C. belong the black snake (q.v.) of America, and the serpent of Æsculapius (*C. Æsculapii*), figured by the ancients as an attribute of their god of medicine. It is of a brownish color, and attains the length of 4 or 5 feet. It is found in the center and s. of Europe, is easily tamed, and exhibits the greatest gentleness of manners.

COLUBRI'NA, one of the sub-orders of serpents, distinguished from the viperina by being oviparous, and by a different arrangement of teeth and maxillary bones. The C. includes more than half the known species of snakes.

COLU'GO. See FLYING LEMUR.

COLUM'BA, SAINT (called also ST. COLUM-CILLE and ST. COLM), one of the greatest names in the early ecclesiastical history of the British isles, was born (it is believed, at Gartan, in the county of Donegal) in the n. of Ireland, on the 7th of Dec., 521. His father, Fedhlimidh, of the powerful tribe of the Cinel Conaill, was a kinsman of more than one chief or prince then reigning in Ireland and in the w. of Scotland; and his mother, Eithne, was also of royal descent. To this distinguished parentage, no doubt, he owed some measure of his great influence upon the minds of his countrymen.

He studied first at Moville, at the head of Strangford Lough, under St. Finnian, by whom he was ordained a deacon; and afterwards under another St. Finnian, at Clonard, where he was ordained a priest. Among his fellow-disciples, he is supposed to have had St. Comgall, St. Ciaran, and St. Cainnech; and so conspicuous was his youthful devotion, even in that saintly company, that he received the name by which he is perhaps still best known in Ireland—"Colum-cille," or "Columba of the Church." In 546, when no more than twenty-five, he founded Derry, and six or seven years afterwards, Durrow, the greatest of all his Irish monasteries. He seems now to have embroiled himself in the civil strifes of his country; and the belief that he instigated the bloody battle of Cooldrevny, in 561, led to his excommunication by an Irish ecclesiastical synod. The justice of the sentence was challenged by ecclesiastics of rank, but it was probably among the causes which determined him to leave Ireland.

It was in 563, when in his 42d year, that, accompanied by twelve disciples, he set sail for the little island of Hy or Ioua, as it was then called—now better known as Iona (q.v.), or I Colum-cille—of which he obtained a grant, as well from the king of the Picts as from his kinsman the king of the Scots. Having planted a monastery here—built, it would seem, chiefly of wattles—he set himself to the great work of his life, the conversion of the Pictish tribes beyond the Grampians. The Picts dwelling to the s. of that mountain barrier had been converted by St. Ninian of Whithern, in the 5th c.; and the Scots who peopled the western shores and islands of Scotland, were either Christians before they passed over from Ireland, or were afterwards converted by Irish missionaries. St. C. now brought the Picts of the n. to the true faith; but, unfortunately, very little is known of the way in which he accomplished his task. Bede speaks simply of his "preaching and example." Adamnan, extolling his gift of miracles, tells how the gates of the Pictish king's fort burst open at his approach, and how, as he chanted the 45th Psalm, his voice was preternaturally strengthened, so as to be heard like a thunder-peal above the din and clamor by which the Pictish magicians

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tried to silence his evening prayer under the walls of the Pictish palace. We get another glimpse of his missionary footsteps from the *Book of Deer*, a Celtic MS. of the 11th or 12th c., lately discovered at Cambridge. It records how "Colum-cille and Drostan, the son of Cosreg, his disciple, came from Hy, as God had shown them, to Aberdour" (a beautiful little bay among the huge cliffs which fringe the coast of Buchan, as the n.e. district of Aberdeenshire is still called); how "Bede, a Pict, was then high-steward of Buchan, and gave them that town in freedom for evermore;" how "they came after that to another town, and it was pleasing to Colum-cille, for that it was full of God's grace; and he asked of the high-steward, Bede, that he would give it to him, but he gave it not; and, behold, a son of his took an illness, and he was all but dead, and the high-steward went to entreat the clerics that they would make prayer for his son, that health might come to him; and he gave in offering to them from Cloch-in-Tiprat to Cloch-Pette-mic-Garnait; and they made the prayer, and health came to him." In some such way as this, St. C. and his disciples seem to have traversed the Pictish mainland, the Western islands, and the Orkneys, establishing humble monasteries, whose inmates ministered to the religious wants of the people. The parent-house of Iona exercised supremacy not only over all these monasteries, but over all the monasteries which St. C. had built in Ireland, and over those which were founded by his disciples in the northern provinces of England when they converted the Angles and the Saxons. Thirty-four years appear to have been spent by St. C. in raising up and perfecting his ecclesiastical system in Scotland. But the labor did not so wholly engross him, but that he found time for repeated voyages to Ireland, and for a visit to Glasgow, where St. Kentigern or Mungo was restoring Christianity among the Welsh or British tribes of Cumbria and Strathclyde. The health of St. C. seems to have begun to fail in 593, but his life was prolonged till he reached his 77th year, when he breathed his last as he knelt before the altar of his church in Iona, a little after midnight, between the 8th and 9th of June, 597. He was buried within the precinct of his monastery, and his bones, which were afterwards enshrined—the stone pillow on which he slept, his books, his pastoral staff, and other things which he had loved or used, were long held in great veneration. No composition certainly known to be his has been preserved; but there have been attributed to him three Latin hymns of some merit, a short monastic (or rather heremitical) rule in Celtic, and several Celtic poems, among which is a collection of his prophecies.

The strength of St. C.'s character appears to have been in its earnestness. There is no reason to think that he was reputed either wiser or more learned than the better class of the ecclesiastics of his age. But the same enthusiastic temper which won for him in boyhood the name of "Columba of the Church," continued to animate him throughout life. The length and frequency of his fasts and vigils are spoken of as nearly incredible. With this asceticism he combined unwearied industry; no hour passed without his allotted duty of prayer, or reading, or transcribing, or other work. As the prevailing austerity of his disposition was often lighted up by gleams of tenderness and kindness, so it appears to have been clouded at times by anger and revenge. "But whatever sort of person he was himself," wrote Bede, in allusion probably to these infirmities, "this we know of him for certain, that he left after him successors eminent for their strict continence, divine love, and exact discipline; men who follow, indeed, doubtful cycles in their computation of the great festival [i.e. Easter], because, in that far out of the world abode of theirs, none had ever communicated to them the synodal decrees relating to the paschal observance, but yet, withal, men diligently observing those works of piety and chastity, and those only, which they were able to learn from the writings of the prophets, evangelists, and apostles.

The ecclesiastical system of St. C. was in so far peculiar that, in the words of Bede, Iona "had always for its ruler a presbyter abbot, to whose jurisdiction both the entire province, and the bishops themselves also, contrary to the usual order of things, must own subjection, after the example of that first teacher of theirs, who was no bishop, but a presbyter and monk.' The jurisdiction usually reserved to the episcopate was thus transferred to the abbatial office; little more being left to the bishop than the right of ordination, and a certain measure of precedence in the celebration of divine service. St. C. himself, as well as his followers generally, till the year 716, kept Easter on a different day, and shaved their heads after another fashion, than obtained in other parts of western Christendom. But, with these exceptions, their creed and rites appear to have been substantially the same.

The life of St. C. was written by two of his successors in the abbacy of Iona—Cuimine Ailbe (637–669), and St. Adamnan (679–704). The first of these lives is incorporated in the second, which is altogether one of the most valuable works now extant on the early ecclesiastical history of Scotland and Ireland. It has gone through many editions; the last, and incomparably the best—a book, indeed, beyond praise—being that of William Reeves, D.D., printed at Dublin in 1857, for the Bannatyne club and the Irish archæological and Celtic society, and included in the series of *Historians of Scotland*, published by Edmonston and Douglas. Besides his *Vita Sancti Columbæ*, Adamnan wrote *De Locis Sanctis*, an interesting account of Jerusalem and its neighborhood, from the information of a French bishop, who, in returning from the Holy Land, was driven among the western isles of Scotland. This tract has been more than once printed, and its chief passages were transcribed by Bede in his *Historia Ecclesiastica Gentis Anglorum*.

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We learn from it that waxed tablets for writing were in use among the disciples of St. C. in Iona at the close of the 7th century.

COLUMBAN, or **COLUMBANUS**, SAINT, one of the most learned and eloquent of the many missionaries whom Ireland sent forth to the continent during the dark ages, was b. in Leinster about the year 550. Having studied under St. Comgall, in the great monastery of Bangor, in Ulster, he passed over to France, accompanied by twelve companions, and founded the monasteries of Annegray, Luxeuil, and Fontaine. His adherence to the Irish rule for calculating Easter involved him in controversy with the French bishops about 602; and a few years later, the courage with which he rebuked the vices of the Burgundian court led to his expulsion from France. Passing through Switzerland into Lombardy, he founded, in 612, the famous monastery of Bobbio, in the Apennines, where he died on the 21st Nov. 615. His life, written within a century after his death, by Jonas, one of his successors in the abbacy of Bobbio, has been repeatedly printed. The writings of St. C., which are wholly in Latin, consist of a rule for the government of his monastery, a few poems, several letters on ecclesiastical affairs, and 16 short sermons. His monastic rule has been printed more than once; but the most complete edition of his works is in Fleming's *Collectanea Sacra*, published at Louvaine in 1667, and now of such rarity that a copy of it sells for about £35. Of the sermons of St. C., M. Guizot remarks, that "the flights of imagination, the pious transports, the rigorous application of principles, the warfare declared against all vain or hypocritical compromise, give to the words of the preacher that passionate authority which may not always and surely reform the soul of his hearers, but which dominates over them, and, for some time at least, exercises paramount sway over their conduct and their life." The town of San Colombano, in Lombardy, takes its name from the Irish monk, as the town and canton of St. Gall (q.v.), in Switzerland, perpetuate the name of the most favored of his disciples.

COLUMBA'RIUM (Lat.), a dove-cote or pigeon-house. When used in the singular, C. also signified a particular kind of sepulchral chamber used by the Romans to receive the ashes of bodies which had been burned. The name was derived from the chamber being surrounded by small niches or holes resembling the holes in a dove-cote (columbaria) in which the urns (*ollæ*) were deposited. Tombs of this description were chiefly used by great families for depositing the ashes of their slaves and dependents. Several of them are still to be seen at Rome. One, quite perfect (figured in *Smith's Dictionary of Greek and Roman Antiquities*), was discovered at the Villa Rufini.

COLUMBIA, a name long applied to the region to the w. of the Rocky mountains, comprehending the present states of Oregon and Washington, and British Columbia.

COLUMBIA, DISTRICT OF. See DISTRICT OF COLUMBIA.

COLUMBIA, a co. in s.w. Arkansas, on the Louisiana border; 825 sq.m.; pop 1890, 19,893, includes colored. Has a level and fertile soil, producing corn, cotton, etc. Co. seat, Magnolia.

COLUMBIA, a co. in n.e. Florida, on the Georgia border, bounded by the Suwannee and the Santa Fé rivers; 862 sq.m.; pop. 1890, 12,877, includes colored. Surface level and soil sandy; productions mainly agricultural. Co. seat, Lake City.

COLUMBIA, a co. in e. Georgia, on the Savannah river and the South Carolina border, traversed by the Georgia railroad; 333 sq.m; pop. 1890, 11,281, includes colored. The surface is uneven; productions, agricultural. Co. seat, Appling.

COLUMBIA, a co. in s.e. New York, e. of the Hudson river, on the border of Massachusetts, traversed by the New York Central and Hudson river, Boston and Albany, and the Kinderhook and Hudson railroads; 691 sq. m.; pop. 1890, 46,172. The surface is varied and the soil productive. There are warm springs at New Lebanon. The chief productions are rye, corn, oats, buckwheat, potatoes, hay, butter, wool, hops, and orchard fruits. Co. seat, Hudson.

COLUMBIA, a co. in n.w. Oregon, bounded e. and n. by the Columbia river, which separates it from Washington; area, about 693 sq. m.; pop. '90, 5191. Coal and iron are found. Co. seat, St. Helen.

COLUMBIA, a co. in e. Pennsylvania, on the Susquehanna river, and the Philadelphia and Reading and other railroads; 480 sq. m.; pop. 1890, 36,832. Spurs of the Alleghany range make the surface hilly and mountainous, but the valleys are fertile. Iron ore, and limestone are abundant. Productions, chiefly agricultural. Co. seat, Bloomsburg.

COLUMBIA, a co. in s.e. Washington; formed 1875; bordering on Oregon. The Snake or Lewis river bounds it on the n. The surface is hilly in parts, the soil productive; grain and cattle are principal exports; 864 sq. m.; pop. 1890, 6709. Co. seat, Dayton.

COLUMBIA, a co. in s. Wisconsin, intersected by the Wisconsin river, and crossed by the Chicago, Milwaukee and St. Paul, and Wisconsin Central railroads; 780 sq. m.; pop. 1390, 28,350. The surface is rolling or hilly. Co. seat, Portage.

COLUMBIA, a town and co. seat of Boone co., Mo., 35 miles n.w. of Jefferson city on the Wabash railroad; pop. '90, 4000. The town is the seat of the State University, Christian College and Baptist Female College, and is in a mining, farming, and stock-raising region.

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COLUMBIA, a tp. includ. Madisonville vill., in Hamilton co., Ohio. Pop. '90, 8422.

COLUMBIA, a borough in Lancaster co., Penn.; on the Susquehanna, here more than a mile wide, and the Philadelphia and Reading railroad; 28 miles s.e. of Harrisburg. Wrightsville, on the w. bank of the river, is connected with the borough by one of the longest bridges in the U. S. The place was founded in 1726 by English Quakers from Chester co., and was for many years called Wright's Ferry. In 1798 it was proposed to locate the capital of the U. S. here, and the measure failed of adoption by only one vote. In June, 1863, the original bridge was burned to prevent the confederate troops from marching on Philadelphia. The borough is important as a market for lumber floated down the river and as a coal depot. Its manufactures include boilers and engines, railroad iron, machinery, refined oil, flour, sawed lumber, malt liquors, stoves, etc. There are banks, a public library, St. Peter's Convent school, waterworks, electric light works, and several newspapers. Pop. '70, 2236; '90, 10,599.

COLUMBIA, city, capital of South Carolina, and co. seat of Richland co., on the e. side of Congaree river, near the junction of the Broad and Saiuda rivers, 137 m. n.w. of Charleston, and reached by five railroads; pop. '90, 15,353, half colored. The river is navigable to this point. The city is handsomely laid out, and the surrounding views are very fine. There is a fine park, and the streets are well shaded. The state house, built of granite, occupies a commanding situation near the center of the city. The executive mansion and the city hall are also attractive buildings. The city is well supplied with water and gas, and has a very considerable manufacturing industry, owing to its abundant water-power, to the extensive forests in its vicinity, which supply its many saw-mills, and to the granite and clay found in or near the city limits. There are oil, cotton, sash and door factories, foundries, etc.; national and savings banks. Among educational and other institutions are South Carolina university, founded in 1804, Smyth theological seminary (Presbyterian), Columbia Female College (M. E. S.), Benedict College (Baptist), Allen University (African Meth.), and the Winthrop Normal College. The state insane asylum and penitentiary are located here. In the n.w. suburbs are the fair grounds of the S.C. agricultural and mechanical society. In response to a demand for a more central place of government than Charleston, the legislature, in 1786, ordered C. to be laid out, and in Jan., 1790, met there for the first time. At an early date the navigation of the river was improved by the construction of canals around the falls. During the war of the secession, the old state house and its library of 25,000 volumes, a convent, several churches, the railroad depot, and a vast quantity of cotton were burned, but the city rapidly recovered its prosperity.

COLUMBIA, a city and co. seat of Maury co., Tenn., on Duck river, 45 m. s. of Nashville, on the Louisville and Nashville and the Nashville, Chattanooga, and St. Louis railroads. It has a U. S. arsenal, the Columbia Athenæum, national and other banks, manufactories of flour, furniture, carriages, ice, pumps, cotton, etc., and several newspapers. C. is an important live stock market. Pop. '70, 2550; '90, 5370.

COLUMBIA, BRITISH, since 1871 a province of the Dominion of Canada, is divided into two parts—the mainland, commonly called British C.; and Vancouver's Island (q. v.). These were formerly independent colonies, but were united in 1866. The total area of the province is estimated at 383,300 sq. m. As Vancouver's Island is separately treated, the present article, as far as possible, will confine itself to an account of the mainland, which is situated in lat. 49° to 60° n., long. 114° to 138° w., and measures over 420 m. in breadth by 300 in length, its total area being estimated officially at 340,000 sq. miles. Its northern limit, as settled by act of Parliament in 1858, follows the Simpson river to the Pacific ocean on the w., and the Finlay, an affluent of the Peace, to the Rocky mountains on the east. Running parallel with the chain on the e. border, which itself rises, in Mt. Brown, to a height of 16,000 ft., two ranges divide the width of the country into three sections of drainage. In the e. are head-waters, which find opposite outlets in the estuaries of the Columbia and of the Mackenzie; through the entire middle, and part of the e., the Fraser maintains a southerly course, till, at fort Hope, it is bent sharply to the right by a mountain barrier, so as to enter the gulf of Georgia barely within the international boundary;* and lastly, across the w., a series of streams, generally meeting long and narrow inlets of the ocean, and terminating in the Skeena, which, with its upland reservoir, Babine lake, of 100 m. in length, is but little inferior to the Fraser itself. The principal harbors are Burrard Inlet, on the gulf of Georgia, a few miles from New Westminster, and the chief port for the lumber trade: Howe Sound, n. of Burrard Inlet; Bute Inlet, still further n.; Millbank Sound, which will become valuable as the gold mines on the Peace river attract a population; the river Skeena, now ascended by steam-vessels, and one of the routes to the Ominica gold mines; and the river Nass, near the frontier of Alaska, watering a region also believed to be rich in gold.

The interior of British C., i.e., the region between the Cascade range and the Rocky mountains, is, on the whole, rugged and lofty, and though rivers are numerous, they do not serve the purposes of irrigation, being often confined within deep ravines. Still the tracts of arable land are of considerable extent, and very fertile. In one year, land

* The decision of the German emperor (21st Oct., 1872) on the *San Juan Boundary Question* affirmed the accuracy of the American interpretation of the treaty of 1846, in virtue of which the boundary of the United States runs through the Haro channel, and the San Juan archipelago, lying between Vancouver's island and the mainland, and commanding the outlet to the Pacific, is assigned to the latter power.

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1700 ft. above the sea-level, yielded, under proper irrigation, 40 bushels of wheat per acre. The pastures of British C. are, however, likely to prove much more valuable than its arable ground. They are almost endless in extent. On the Cariboo road (between Soda creek and Quesnel), there is a plain 150 m. long, and 60 or 80 wide; and between the Thompson and Fraser rivers there is an immense tract of grazing land. The hills and plains are covered with bunch grass, on which the cattle and horses live all winter, and its nutritive qualities are said to exceed the celebrated blue grass and clover of Virginia.

The forest lands are also of vast extent, and yield most valuable timber. The principal trees are the Douglas pine, Menzies fir, yellow fir, balsam hemlock, white pine, yellow pine, cedar, yellow cypress, arbor vitæ, yew, oak, white maple, arbutus, alder, dog-wood, aspen, cherry, willow, and cotton-wood. The Douglas pine is almost universal on the sea-coast and up to the Cascade range. The cedar, white pine, and maple are found everywhere; the Scotch fir, the willow, and cotton-wood on the bottom-lands. But the lumber-trade is only beginning; the value of the exports, in 1870, amounting to little more than £25,000. The Fraser river and its tributaries, with the numerous lakes communicating with them, furnish great facilities for the conveyance of timber. The lower Fraser country especially is densely wooded. Smaller streams and the numerous inlets and arms of the sea do the same thing for the region further north.

The *fisheries* of British C. are perhaps the richest in the world, but their distance from populous centers has hitherto prevented their development. Whales and seals abound off the northern coasts. Sturgeon are plentiful in the rivers and estuaries; they are found weighing over 500 lbs., and are easily caught. The salmon of the Fraser river are famous over the American continent; so are the oulachans, small sprat-like fish, which enter the river in millions; some are so full of oil that, it is said, they will burn like a candle. Cod, herring, halibut, anchovies, haddock, etc., are caught in great quantities.

Steamers now ascend the Fraser as far as Fort Yale, and others have been put on in various parts of the province, to provide easier access to the mining districts; but the inland routes are of the rudest description. Up the left of the Fraser, however, there is a tolerable road as far as Lytton at the confluence of the Thompson. The grand obstacle, however, in the way of all improvements, centers in the more attractive character of mining than of any more regular pursuit. Independently of silver, which has been discovered in the lower basin of the Fraser, and of copper, which is known to exist immediately to the e. of the same, gold may be said to be universally diffused. In addition to the old "diggings," new mines were opened in 1871, in the n., in the Peace and Ominica district, and yielded in the same year over $400,000. The total yield for the province in 1895 was $636,545, and the total yield from 1857 was estimated at $54,985,600, from 1862, $47,955,562. The only obstacles to the prosecution of almost inexhaustible gold-mining are the want of roads, the want of capital, and the want of a thorough geological survey. Silver mines have been opened in the Fraser valley. Coal and iron are also found. Furs are one of the most important products of the country, the value of the exports of that article annually being upwards of $200,000,000. The most valuable are the black and silver fox, sea otter, red fox, fur seal, mink, martin, beaver, and common otter. Buffalo are found on the plains; bears and goats and sheep on the mountains; elk are met with on the coast, and deer on the groups of small islands; wild ducks and geese are abundant; grouse and snipe are found everywhere; and in the plains a kind of tall buff crane, 4 or 5 ft. high.

The *climate* varies according to the locality, owing principally to four causes: (1) greater or less distance from the sea; (2) or from the mountain regions; (3) difference in the variety and growth of vegetation; (4) difference of level. The low portions near the sea and on Vancouver's island have a moderate climate, with a temperature ranging from 20° in winter to 80° in summer. The spring is short, lasting from the beginning of Mar. to the early part of May; summer, from May till Sept.; the next two months are autumn, of which winter is only an aggravation, the snows being light, and the frosts far from severe or lasting.

To its mineral resources, British C. mainly owes its present position. It was the discovery of gold in 1857—coinciding as it did with the expiration of the Hudson's Bay Company's licensed monopoly—that led to the establishment of the colony in 1858. In 1897 great excitement was created in Canada, the United States, and Great Britain by gold discoveries in and about KLONDIKE (q. v.). According to the census reports, the population of the province was 36,247 in 1871; 49,459 in 1881; and 98,173 in 1891. Indians were formerly numerous, but their numbers are diminishing from smallpox, measles, and tribal wars. As the Canadian Pacific railway is completed, this province has become one of the most valuable in the Dominion. The different routes proposed once provoked much local contention; but the visit of Lord Dufferin, the governor-general, in 1876, rendered good service in removing obstacles to this great enterprise. Free public education was established in 1872.

British C. is represented in the Canadian parliament by 3 senators and 6 members of the house of commons; but it has also a local legislature, a lieut.gov., and an executive council. The chief towns are Victoria and Vancouver.

COLUMBIA, or OREGON, one of the largest streams in America, rises in the Rocky mountains, draining that range by means of its different head-waters, from about lat. 54° n. to about lat. 42° n. Its two main branches—the C. proper from the n.n.e., and the Snake from the s.e.—meet about lat. 46° 5′ n., long. 118° 55′ w., and united,

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POPULATION OF BRITISH COLUMBIA, MANITOBA, AND THE TERRITORIES.

(ROYAL CENSUS: 1891 AND 1881.)

BRITISH COLUMBIA.

	1891.	1881.		1891.	1881.
Cariboo	4,959	7,550	Yale (est.)	13,661	9,200
New Westminster	42,226	15,417			
Vancouver	18,229	9,991	Total	98,173	49,459
Victoria	18,538	7,301			

MANITOBA.

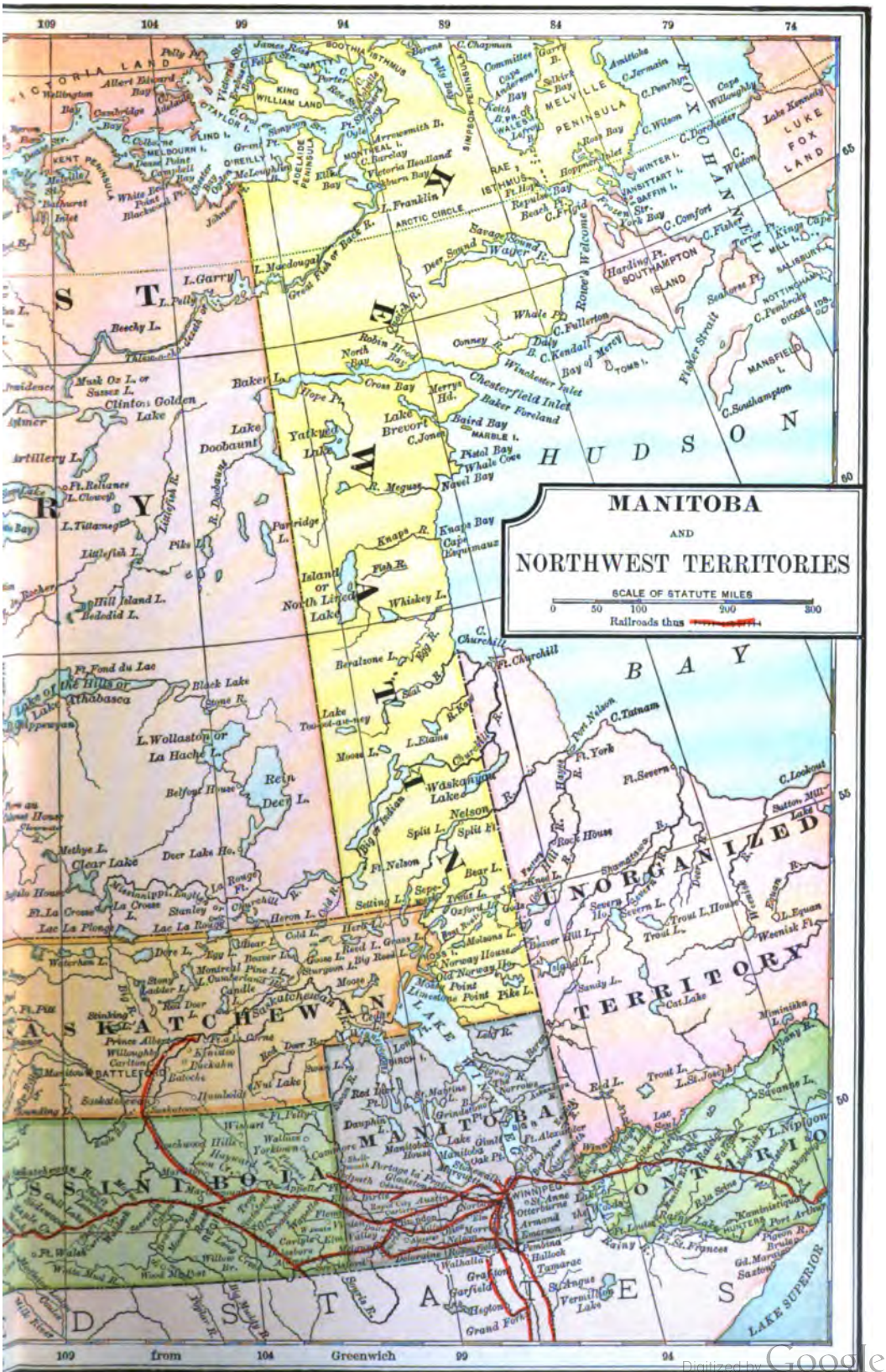
	1891.	1881.		1891.	1881.
Lisgar	22,103	12,679	Winnipeg	25,639	7,985
Marquette	36,069	15,449			
Provencher	15,469	12,496	Total	152,506	62,260
Selkirk	53,226	13,651			

THE TERRITORIES.

	1891.	1881.		1891.	1881.
Alberta (est.)	25,277	.....	Unorganized	32,168	30,931
Assiniboia	30,372	.....			
Saskatchewan	11,150	25,515	Total	98,967	56,446

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134
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124
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114
65
55
50
ALASKA
NORTH WESTERN TERRITORY
BRITISH COLUMBIA
ATHABASCA
ALBERTA
PACIFIC OCEAN
Arctic Ocean
Yukon R.
Circle City
Dawson City
KLONDIKE REGION
Ft. Reliance
Ft. McPherson
ARCTIC CIRCLE
Mackenzie R.
Great Bear Lake
Ft. Norman
Ft. Simpson
Ft. Providence
Great Slave Lake
Ft. Resolution
Ft. Liard
Ft. Nelson
Ft. Dunvegan
Ft. St. John
Ft. McLeod
Ft. Assiniboine
Ft. Saskatchewan
Edmonton
Athabasca R.
Peace R.
Liard R.
Fraser R.
Columbia R.
Kootenay R.
Vancouver
New Westminster
Victoria
Nootka Sound
Queen Charlotte Is.
MT. ST. ELIAS
MT. VANCOUVER
MT. FAIRWEATHER
MT. CRILLON
MT. OLYMPUS
Longitude West
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run together to long. 124° 5′ w., where they empty themselves into the Pacific in a latitude corresponding with that in which they joined. This great river, long vaguely believed to exist, was discovered only in 1792, by Capt. Gray of Boston in Massachusetts, who gave it the name of his own vessel in place of the floating appellations of the Oregon and the San Roque. The extreme length cannot be less than 1200 m.; most of its course—all, in fact, but the upper part of the n. branch—being within the limits of the United States. Nevertheless, the entire navigation is equally open to the British and to the Americans. That navigation, however, is of comparatively little value, more particularly to the former nation. The river is broken by falls and rapids into many separate portions; and of these, even the lowest and most important, the maritime reach itself, does not exceed 90 m. in length. In addition to the inland impediments, the ingress and egress are embarrassed by a surf-beaten bar, which, with few and precarious passages, extends from cape Disappointment on the n., to point Adams on the south. Still, as a harbor, the C. has the recommendation of being decidedly the best on the coast between San Francisco, which is nearly 600 m. to the s., and Port Discovery, which is fully 150 m. to the north.

COLUMBIA COLLEGE. In Dec., 1746, an act of the colonial assembly was passed to raise money by public lottery for the encouragement of learning and towards the founding of a college in the city of New York. The amount thus raised was vested in ten trustees, seven of whom were members of the church of England, and some of them vestrymen in Trinity Church. A parcel of ground, w. of Broadway, bounded by Barclay, Church, and Murray streets, and the Hudson river, was granted by Trinity Church as the site for the college. On a portion of this, at the foot of what was afterwards called Park place, the college edifice was built, the rest of it was leased and became a very valuable endowment. Dr. Samuel Johnson, of Connecticut, was chosen president, and in July, 1754, commenced the instruction of a class of students in the school-house belonging to Trinity Church. Soon after a charter was obtained, according to which the institution was called King's College, and was to be governed by a board of trustees, consisting of the archbishop of Canterbury, the first lord commissioner for trade and plantations, the lieutenant-governor of the province, several other public officers, the ministers of the five principal religious denominations in the city, and twenty-four private gentlemen. The new buildings were first occupied in 1760. In 1763, a grammar school was established. In March of that year, on the resignation of Dr. Johnson, the Rev. Dr. Myles Cooper of Oxford, Eng.—an accomplished scholar—was elected president. In 1767, a grant of land containing 24,000 acres was obtained from the province, but as it was within the bounds of what afterwards became the state of Vermont, it was ultimately lost. In Aug., 1767, a medical school was established. Before the war of the revolution, the emoluments of the college were largely increased by grants from the king and by contributions in England and America; and the course of instruction was extended so as to include "divinity, natural law, physic, logic, ethics, metaphysics, mathematics, natural philosophy, astronomy, geography, history, chronology, rhetoric, Hebrew, Greek, Latin, modern languages, the belles-lettres, and whatever else of literature may tend to accomplish the pupils as scholars and gentlemen." Among the earliest graduates were Robert R. Livingston, Gouverneur Morris, and John Jay "All students, except those in medicine, were required, unless specially exempted, to live in the college building, the grounds of which were surrounded with a high fence whose front gate was constantly attended by a porter and was closed each evening in winter at 9 o'clock, and in summer at 10. The names of all students who came in after the hour were reported to the president." In the disputes which arose with England, Dr. Cooper wrote on the side of the mother country and was answered by an anonymous correspondent, who afterwards was found to be Alexander Hamilton, then a student. When the war commenced, Dr. Cooper returned to England, and the Rev. Benjamin Moore was chosen to take his place. In 1776, the building became a military hospital, the students were scattered and the college was broken up. On the return of peace, when its affairs were put in order, its name was changed to Columbia College, and its original charter, with the necessary alterations, was confirmed by the legislature of the state. DeWitt Clinton was among the first students under the new order of things. In May, 1787, Dr. William Samuel Johnson, an eminent lawyer and statesman, and son of the first president, was elected to the office. Among the students of this period, was John Randolph of Roanoke. In July, 1800, Dr. Johnson resigned, and was followed first by Dr. Wharton and soon after by Bishop Moore, with the understanding that, on account of his ecclesiastical duties, he would not ordinarily take an active part in the business of the college. In 1810, the standard of admission was raised and a new course of studies arranged. In 1811, bishop Moore having resigned, in order that a president might be chosen who could give his whole time and attention to the office, Rev. William Harris was elected, with the addition of Rev. John M. Mason as provost. This office was created for Dr. Mason, and held by him only. He had charge of the senior class and gave new life to the lecture-room. He resigned in 1816. In 1814, a grant of land, containing about 20 acres, and then valued at $5,000, was made to the college by the legislature, with the condition (afterwards repealed) that new college buildings should be erected on it. As this ground is between 5th and 6th avenues, and extends from 47th to 51st street, its value has, of course, vastly increased. Between 1817 and 1820, the old edifice was thoroughly repaired and additional buildings were erected. In 1829, a grammar school was established under the charge of the faculty, and a building for it erected within the grounds. This school was

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discontinued in 1864. In 1847, the study of German was made voluntary for the two higher classes, and in 1857 for all the classes, with the addition of two annual prizes of $30 each, and two of $20 each, in order to stimulate attention to the study. The requirements of commerce having, after the lapse of a century, made the removal of the college from its original site necessary and desirable, new buildings were erected for it on the block extending from 49th to 50th street, between 4th and Madison avenues, and were occupied in 1857. At the same time the scope of instruction was greatly enlarged and several new professors were added to the faculty. Instruction in law had been given at Columbia as early as 1793 by Chancellor Kent, whose lectures then, and at his second holding of the professorship from 1823–5, attracted much attention. But nowhere in America was law systematically taught until the Columbia Law School was established in 1858. Under Prof. T. W. Dwight, the school was conducted with remarkable success, having a two-year course up to 1888, when another year was added. On Prof. Dwight's resignation in 1891, the Law School was wholly reorganized and Prof. W. A. Keener made dean. Columbia had a medical faculty from 1767 to 1810, when it was discontinued because of the establishment of the college of physicians and surgeons. In 1860, this college of physicians and surgeons was made nominally the medical school of Columbia; yet it still retained its independence. In 1891, however, its unrivaled equipment and organization became an integral part of Columbia college. The School of Mines was established in 1864, largely through the exertions of Prof. Thomas Egleston. Aiming at first to give a thorough knowledge of the art of mining, by rapid growth and expansion it has introduced courses in civil engineering, analytical and applied chemistry, geology and paleontology, metallurgy, mineralogy, architecture, sanitary and electrical engineering; each leading to an appropriate degree. The School of Mines was the first and in many respects the most successful of those schools in America which aim to train men in the fields of practical science. In 1880 was opened the School of Political Science, a pioneer in the systematic study of the political and economic sciences. In 1890, with the installation of the Hon. Seth Low as president, began a general reorganization and extension of all departments of the college, with a view to correlating the different schools, and facilitating university work. To this end a University Council was established, composed of the president, the dean, and one member from each of the faculties (arts, medicine, law, applied science, political science, philosophy, pure science). This council deals with matters affecting the university as a whole, and the relations between the several faculties. The formation of a school of philosophy in 1892, devoted to advanced courses in philosophy, philology and letters; and the division of the faculty of mines into the faculties of pure and of applied science (1896) were further steps. On February 3, 1896, by order of the trustees, the whole institution with its several schools was designated as Columbia university, the name Columbia college being reserved to the school of arts or academic department.

Columbia's position as a university is strengthened by extensive relations with other institutions. Barnard college for women, founded in 1889, is practically a part of Columbia, for, though a distinct corporation, her courses of instruction and degrees are controlled by Columbia. With the Teachers' college, Columbia is in close alliance, and bestows all degrees. Students of Columbia can, under certain conditions, study in the Union, the General, and the Hebrew theological seminaries. Columbia also has close relations with Cooper Union, The American Museum of Natural History, The Metropolitan Museum of Art, and the New York Botanical Garden, and conducts courses of lectures in these institutions. Columbia university as at present organized consists of Columbia college and six university faculties,—law, medicine, applied science, political science, philosophy, and pure science; and ten schools,—Columbia college (or school of arts), law, medicine, mines, chemistry, engineering, architecture, political science, philosophy, pure science. The site at Madison Avenue and 49th Street—on which, between 1874 and 1883, three fine buildings were erected—having long been inadequate, in 1892 the trustees bought from the New York hospital a part of the grounds of the Bloomingdale insane asylum on Morningside Heights, the plot between Amsterdam Avenue, and the Boulevard running from 116th to 120th Street. This splendid new site containing eighteen acres is on a plateau 150 feet above tide water; Barnard college and Teachers' college are contiguous, and the Grant monument, cathedral of St. John, St. Luke's Hospital and other public buildings are near. A magnificent library building given by Pres. Low, Schermerhorn hall, Havermeyer hall, the physics building and the engineering building, were completed in 1897. Another important structure is the university building, 176 by 260 ft. to contain the university theatre, gymnasium, dining hall and university offices. The grounds and the buildings already constructed or planned, are designed on a liberal scale to attain the highest utility and artistic effect. The architects are McKim, Mead and White, of New York. The university removed to its new site in October, 1897. The school of medicine, college of physicians and surgeons, is at 59th Street and 10th Avenue, with ample accommodations in buildings and outfit. Columbia possesses excellent scientific collections and apparatus, and a university library, second in size and importance to that of Harvard only. It has been gathered chiefly since 1882, and is rapidly growing, containing in 1897 250,000 volumes. Its arrangement, catalogue and the liberality of its administration are unrivaled. It is rich in the fields of political science, economics, architecture, art and other subjects, is unusually strong in periodicals and the transactions of learned societies in all sciences, and her many valuable special collections, notably the Avery architectural library of 15,000 volumes. Its excellent botanical library and the herbarium are deposited with the New York botanical garden. Columbia university, whose legal style is still

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Columbia college in the city of New York, is governed by a president and self-perpetuary board of 24 trustees. Its annual budget is more than $800,000, and in 1896-97 it had 289 officers of instruction, and 1858 students, and offered over 600 distinct courses of study. Besides official publications and published dissertations, over twenty scientific periodicals and serials are issued from the university or with the co-operation of the faculties. For the furtherance of athletic sports the university has a boat house on the Hudson and athletic grounds at Williamsbridge, together with a gymnasium. To the Hon. Seth Low, elected president of the university in 1890, much of recent progress is due. Among earlier presidents were Charles King (q. v.), 1849-1864 and F. A. P. Barnard (q. v.), 1864-1889.

COLUMBIAD, a cast-iron howitzer, intended chiefly for use in sea-coast defense. The howitzer shell guns were remodeled in 1844, when the larger gun was first named columbiad. In 1861, the Rodman exterior form was applied to these and other heavy guns.

COLUMBIAN'A, a co. in e. Ohio on the Ohio and Beaver rivers and bordering on Pennsylvania, traversed by the New York, Lake Erie and Western, and the Pittsburg, Marion and Chicago railroads; 538 sq. m.; pop. '90, 59,029. Co. seat, Lisbon.

COLUMBIAN EXPOSITION. See WORLD'S COLUMBIAN EXPOSITION.

COLUMBIA UNIVERSITY. See COLUMBIA COLLEGE.

COLUM'BIDÆ, a family of birds, often comprehended under the general English names *dove* and *pigeon*, and forming the genus *columba* (Lat. pigeon) of Linnæus. They are generally ranked among gallinaceous birds, but exhibit points of resemblance to the order *insessores*, and have by some naturalists been constituted into a distinct order, intermediate between these. They agree with the true gallinaceous birds in the character of their bill, and in the soft naked tumid membrane at the base of it, in which the nostrils are pierced; also in their *rasorial* (scraping) habits and blunt claws; but they differ very widely from them in their great powers of flight, which are not surpassed in any other family of birds; in having the hind-toe on the same level with the other toes; in having no connecting membrane at the base of the toes; in not being polygamous but pairing, and in the male taking part with the female in the care of the young; in their having generally only two young ones at a time, but breeding often in a year; in their double crop, an expansion of the gullet on both sides, in which they differ from all other birds; and in the secretion, at breeding-time, of a milky fluid by the crop of both parents, as in the parrots, with which the food is saturated in order to fit it for the young, which, unlike those of the true gallinaceous birds, are at first very helpless. The number of species of C. is very great. There is amongst them so much resemblance, that scientific classification has been found very difficult. They are found in all warm and temperate climates, but comparatively few are European. See BIRD, DOVE, PIGEON.

COLUMBINE (It., *colombina*, "little dove") is one of four principal characters in modern Christmas pantomime. Sometimes she takes the part of Pantaloon's daughter, and sometimes that of attendant to the daughter. She is betrothed to Harlequin, and frequently wears a costume resembling his in color, hence the name "Arlecchinetta." Sometimes her costume is that of a chambermaid, but she never lays aside her mask. See HARLEQUIN, PANTOMIME.

COLUMBINE, *Aquilegia*, a genus of plants of the natural order *ranunculaceæ*, having 5 colored sepals, which soon fall off, and 5 petals each terminating below in a horn-shaped spur or nectary. They are natives of the temperate and colder regions of the northern hemisphere.

COLUM'BIUM, or TAN'TALUM (symbol Ta), is a rare metal found in the mineral tantalite, obtained from Bodenmais, in Bohemia, and from Sweden. It can be obtained as a black powder, which assumes a lustrous aspect when subjected to the process of burnishing. It forms a series of compounds, including columbic acid, $Ta_2 O_5$.

COLUMBRETES, or COLOMBRETES, islands in the Mediterranean, off cape Oropesa, belonging to Spain. They are of volcanic origin, and form a picturesque group. There is one good harbor, and on the largest island there are a few inhabitants. The C. are important only as a military station. They have been a noted resort for privateers.

COLUMBUS, city and co. seat of Muskogee co., Ga., at the head of navigation on the Chattahoochee river, 100 miles s.w. of Macon, is reached by the Central of Georgia, the Southern, and the Columbus Southern railroads, and from its important manufactures has been called "the Lowell of the South." It was laid out in 1828, was incorporated in 1829, and in 1865, April 16, was captured by federal forces. The city covers a large area, has wide and handsome streets, and contains among its public buildings a court-house, a public library, an opera house, numerous churches, Columbus college, Wynnton high school, superior schools for whites and colored, several national banks and daily and weekly newspapers. Steamboats ply between this place and Appalachicola, Fla., and the trade in cotton, groceries, liquors, and tobacco with adjoining states is extensive. Among the cotton and woolen mills is one that for years was the largest in the South, having a capital of $1,250,000, 46,600 spindles, and 1,650 looms. There are a cotton compress, large iron works, and manufactures of engines, boilers, carriages, plows, flour, clothing, bagging, bedspreads, oil, bricks, fertilizers, etc. Pop. '90, 17,303.

COLUMBUS, a city and co. seat of Bartholomew co., Ind., 40 miles s.s.e. of Indianapolis, with which it is connected by railroad; manufactures starch, flour, furniture, etc., and has water-works, electric street railways, electric lights, orphans' home, and churches; pop. '90, 6719.

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COLUMBUS, a city and co. seat of Lowndes co., Miss., on the Tombigbee river, and the Mobile and Ohio and the Southern railroads; 132 m. n.e. of Jackson. In the midst of an iron and coal region, it has cotton and oil mills, machine shops, churches, schools, the State Industrial Institute and College, public library, and several periodicals. Pop. '90, 4559.

COLUMBUS, a co. in s.e. North Carolina, between the Waccamaw and Lumber rivers; 940 sq. m.; pop. '90, 17,856. The surface is level and marshy; productions, cotton, rice, etc. The Atlantic Coast Line railroad intersects. Co. seat, Whiteville.

COLUMBUS, city, capital of Ohio, and co. seat of Franklin co.; on both sides of the Scioto river; 70 m. from its mouth and 100 m. n.e. of Cincinnati. The city was laid out in 1812 and incorporated Feb. 10, 1816. Eighteen railroad lines centre in the city, which covers an area of 16¼ sq. m., and has wide, finely shaded streets and many parks, squares, etc.; among them Goodale park, the city park, the horticultural gardens, and the state fair grounds. Greenlawn cemetery is one of several beautiful cemeteries. Among public buildings are the capitol, of gray limestone, U. S. building and barracks, city hall, union depot, Masonic temple, court-house, Odd-Fellows hall, state penitentiary, and asylums for the blind, deaf and dumb, feeble-minded youth, and insane, St. Joseph's cathedral, and Trinity (P. E.) church. The manufactures include carriages, cars, iron and steel, furniture, and boots and shoes. The lumber and coal trade is very large, and natural gas is found. The state university is located here, also Capital univ. (Luth.) and Starling and Ohio medical colleges. In addition there are the Central and North high schools, Columbus Normal School, Latin and English and classical schools, and the Columbus Art School. There are churches, national and other banks, newspapers, state, law, public, and public school libraries, improved water-works, and electric and natural gas plants. Pop. '90, 88,150.

COLUMBUS, BARTOLOMMEO, 1432–1514; the eldest brother of the discoverer. In 1470, he was in Lisbon constructing maps and charts, and it is supposed that he went to the cape of Good Hope with Bartholomew Diaz. He was sent by his brother to England to seek the aid of Henry VII., but there is no evidence that he succeeded.

COLUMBUS, CHRISTOPHER (the Latinized form of the Italian *Colombo*, and the Spanish *Colon*), the great navigator who added a new hemisphere to our globe, is supposed to have been born at or near Genoa, in the year 1436, or as others say, 1446. Though virtually the greatest man of his era, there is little definite information about his family and his early life. It would appear, however, that he was the son of a wool-comber; that he attended for some little time the then great school of learning in Pavia, where he evinced a taste for astronomy and cosmography; and that he early went to sea, and made several voyages in the Mediterranean. Settling in Lisbon in 1470, he there married the daughter of an Italian named Palestrello, who had distinguished himself as a navigator in the Portuguese service, and with her obtained some valuable charts, journals, and memoranda. Lisbon, at this time, was the head-quarters of all that was speculative and adventurous in the way of geographical discovery; and here, while constructing maps and charts for the livelihood of his family, C. first appears to have imbibed that idea of land to the westward, which he was destined after long disheartening years to establish as fact—the land, indeed, not being, as he had supposed it, a prolongation of the eastern shores of Asia, but a new western continent With the view, apparently, of better qualifying himself for his great enterprise, C. made several voyages to the Azores, the Canaries, and the coast of Guinea—then the limit of European navigation in this direction. Not until about 1482 or 1483, did C. find opportunity to lay his scheme before John II. of Portugal. This monarch referred it to a junto of nautical and scientific men, who decided against it. The king, however, meanly taking advantage of a detailed plan obtained from C. under false pretenses, secretly sent out a vessel to examine the route. Too timid to venture far from the beaten track, the pilots soon returned to Lisbon, to throw ridicule on the project. Disgusted with the duplicity of his sovereign, C. secretly left Lisbon in 1484, taking with him his little motherless boy Diego. He found his way to Genoa, where the republic, before whom he unfolded his scheme, treated it as the silly product of a visionary brain: and it is said that he also met with like treatment from the Venetians; but it appears doubtful whether he at this time communicated with them. Disappointed, but not despairing, for C. was buoyed up with the belief that heaven had commissioned him to plant the banner of the cross upon those shores which as yet appeared to exist but in his own imagination, C. turned his steps towards Spain. Weary and hungry, he stopped one day at the gate of the Franciscan convent La Rabidi, in Andalusia, to beg some bread and water for his child. This day was the turning-point in his career. The superior of the convent, Juan Perez de Marchena, passing at the moment, entered into conversation with the traveler, and was so struck with the grandeur of his views, that he used all his influence to procure him the favorable consideration of the king and queen. It was not, however, until seven more years of disappointments had passed over—during which C. had applied to other courts, and without avail—that he found himself in command of three small vessels, only one of which was decked, with 120 men, ready to start on his adventurous enterprise C. claimed, as reward, to be nominated high-admiral, and governor-general and viceroy, over all the lands he discovered, with a tenth of the produce of the countries. On the 3d of Aug., 1492, C. set sail from the bar of Saltes, near Palos. Delaying a month at the Canaries to refit, he started thence, on the 6th of Sept., over unknown seas. His crew soon began to interpose

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their timid fears, and when these were unavailing, to express their open disaffection: but equally disregardful of both, C. bore steadily westward; himself, however, not without misgiving as to what the variation in the needle (not before discovered) portended. On the 12th of Oct., his perseverance was rewarded with the sight of land, which proved to be one of the Bahama islands. Here he solemnly planted the cross, giving the island the name of San Salvador. After discovering several other of the West India islands, including Cuba and Hayti, or San Domingo, at the latter of which, called by him Hispaniola, he settled a small colony, C. set sail again for Spain, where he arrived on the 15th Mar., 1493, and was received with every demonstration of joy and admiration, as well by the people as the court. In Sept. of the same year, he set sail from Cadiz on a second expedition, with 17 ships and 1500 men. In this voyage, he discovered the Caribbee islands, Jamaica, etc.; but calumnies at home forced him to return in 1496. Having cleared himself with his sovereigns, he, in 1498, set out on a third expedition. This time, steering more to the southward, he discovered Trinidad, and the mouths of the Orinoco, and landed at Paria, on the coast of South America. After these discoveries, C. steered for Hispaniola, where he found everything in disorder. The king's ear had been again abused; an officer named Bovadilla had been appointed to supersede C. as governor, and by this person C. was sent home in chains. This unworthy treatment excited the indignation of the Spanish people to such a degree, that Ferdinand was fain to disavow all knowledge of the disgraceful affair. But all C.'s efforts to obtain redress from the king were fruitless. The spirit of adventure, however, which had borne him up amid so many disappointments, was not to be crushed by injustice. It still burned bright and strong as ever within the great old man, who, on the 9th May, 1502, with four vessels and 150 men, set out once more to seek a passage uniting the Atlantic and Pacific oceans, which he imagined lay somewhere between Honduras and Paria. But the mutinous character of his crew forced him aside to seek for gold, and after many difficulties and disasters, and having added little of importance to his previous discoveries, he returned to Spain in Nov., 1504. Isabella was dead; Ferdinand proved basely ungrateful; and so the noblest navigator the world has seen, was permitted to die in poverty at Valladolid, 20th May, 1506. To make up somewhat for his injustice, Ferdinand gave C. a pompous funeral, and erected a magnificent monument to his memory.

Biography furnishes no parallel to the life of C.; great men there have been who have met with disappointments and injustice, but there is perhaps no other instance of a great man whom disappointments and injustice did not dishearten and disgust; who had his greatness recognized in his lifetime, and yet was robbed of the emoluments it entitled him to; and who, after death, had the honor he had so hardly won conferred upon another. On Feb. 18, 1890, the American Congress arranged for celebrating the 400th anniversary of the discovery of America, by an exhibition to be held in Chicago in May, 1893. This act provided the sum of $1,500,000 for the erection of special buildings for the government exhibit, admitted goods for exhibition duty free, and empowered the various governmental departments to contribute towards its success. See the lives by Tarducci; Eng. tr. (1890), and by Winsor (1893).

COLUMBUS, OR **COLON**, LOUIS, 1521 or 2-1572, a grandson of the discoverer. He withdrew his claim to the viceroyalty of India in 1540, and received in exchange the title of duke of Veragua and marquis of Jamaica, and a pension.

COLUMEL'LA.—1. The central axis which remains, formed of the placentas, when the carpels of some fruits have separated from each other and from them.—2. The central axis of the spore-cases (capsules) of mosses.—3. The central axis around which the whorls of many spiral univalve shells are closely wound.

COLUMELLA, LUCIUS JUNIUS MODERATUS, the most learned of Roman writers on practical agriculture, was b. at Cadiz, in Spain, and flourished in the earlier part of the 1st c. of the Christian era. For some time, he resided in Syria, but lived chiefly at Rome, and died, most probably, at Tarentum. His great work, *De Re Rustica*, in 12 books—the 10th, On Gardening, is versified—is addressed to one Publius Silvinus, and treats of arable and pasture lands, culture of vines, olives, etc., care of domestic animals, etc., respective duties of masters and servants, etc. A supplementary treatise relates to trees. This ancient "Book of the Farm" is written in good Latin, and the information is copious, though not precise, and in some points of questionable accuracy. The best editions of C. are by Gesner (1735 and 1773) and Schneider (1794–97).

COLUMN (Lat. *columna*), a pillar or post, usually cylindrical in form, employed for the purpose of supporting a roof, entablature, or other superstructure. As the earliest habitations in almost all countries were formed of wood, it is unquestionable that the earliest columns consisted of the trunks of trees. It is said that even at the present day the Greek peasants of Asia Minor construct their wood-huts so as almost exactly to resemble the form and disposition of parts which we find in the great architectural monuments of classical antiquity. That the Greeks actually made use of wood in the earliest time, even for their monumental structures, we learn on the testimony of Pausanias, who mentions a monument in the market-place at Elis which consisted of a roof supported by pillars of oak; and Pliny tells us that the temple of Juno at Metapontum was supported by pillars made of the stems of vines. From these facts, it is natural to conclude that the stone columns which came first into use would be imitations

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of the trunks of trees; and this we are also in a condition to prove historically, many of the largest stone columns in Egypt—where, from the scarcity of wood, they were earlier introduced than elsewhere—being manifest imitations of the trunk of the palm (figs. 2 and 3). In order to prevent them from being forced into the ground by the superincumbent weight, these early wooden columns were placed upon one or more large flat stones, and on the top another stone was placed, to preserve them from the decay which the rain sinking into the wood would have occasioned. In these primitive arrangements, we plainly perceive the germ of the three principal parts of the classical C.—the shaft, the base, and the capital. As the Doric style of architecture was the earliest of the classical styles, the Doric is naturally the simplest and most severe of the classical columns. One of its most striking peculiarities is what at first sight seems to be the absence of the base (fig. 4). The true account of the matter, however, is, that all the columns in the same line of a Doric temple stand on one base, whereas, in the other orders, each C. has a separate base. But it is in the capitals in all the orders, Egyptian, classical, and Gothic, that columns differ from each other most strikingly (see below). As classical architecture advanced, greater lightness and elegance were sought after; and this, as regarded the C., was obtained by increasing the height and diminishing the proportional thickness of the shaft. In the Ionic and Corinthian orders (figs. 5 and 6), as compared with the Doric, this peculiarity may be distinctly seen.

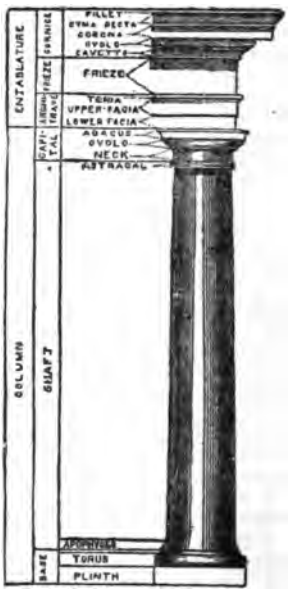


Fig. 1.
Column: Tuscan, with details.

In almost all columns, the shaft tapers gradually from the bottom to the top, thus imitating the natural growth of a tree, and at the same time conforming to a mechanical rule for obtaining the greatest amount of strength in upright bodies. But in place of tapering regularly, the shaft was generally made with a slight swelling towards the middle, called the *entasis*, and had for the most part in all the classical orders striped incisions from top to bottom called flutes or channels, which were regularly worked, and varied in number from 20 to 32. See FLUTING. The relation which subsisted between the height of the C., and

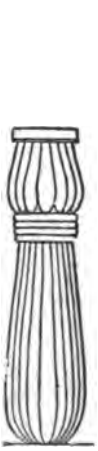


Fig. 2.



Fig. 3.



Fig. 4.

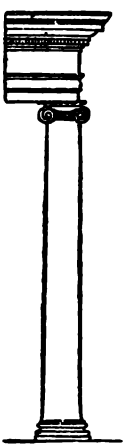


Fig. 5.

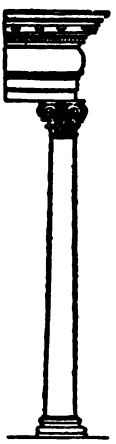


Fig. 6.

the diameter at the top and bottom, and between these and the entablature, has been calculated with the greatest possible precision in all the principal classical examples, and will be found stated in all professional works on classical architecture. The shaft usually consisted of several cylindrical blocks accurately fitted to one another, whilst the capital was commonly hewn out of a single stone. The separate portions of the shaft were fixed together, not by mortar or cement, but by iron cramps, which were fitted into holes in the center, and thus rendered invisible. Sometimes columns of immense size were hewn in the quarry of one piece of stone, and then rolled over the

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ground, and raised to their destined positions by various mechanical contrivances. Columns were often used in classical times, and are employed by us in the interior of buildings to support the roof or galleries, as well as for purposes of decoration; and this custom seems to have prevailed in the halls of persons of great distinction even in Homeric times. In the ancient basilica (q.v.), a line of columns separated the central space which was open to the sky from the aisles of the building, whilst at the same time they supported the galleries which were placed above the aisles. These columns were the origin of the piers or pillars by which the nave is divided from the aisles in Christian churches. The same arrangement prevailed in the Roman atrium. When, in order to support the roof which covered the gallery or any other superstructure, a second row of columns was introduced, it was usually of the lighter styles, Ionic or Corinthian, the lower columns being commonly Doric. Single columns were erected for various purposes, as for mooring ships in harbors, or to commemorate persons of note, or national events. See PILLAR.

Capitals.—In classical architecture, it is by the capitals of pillars, more than by any other feature, that the different orders are distinguished, very much as the Gothic styles are marked by the form of the arch. Till the period of the renaissance, the head of a column, in English, was called chapiter (chapter), its diminutive being chapitrell. The three capitals which alone belong to pure Greek architecture are described in Thomson's well known lines (*Liberty*), so concisely and accurately, that it is needless to dwell on them in prose:

> "First unadorned,
> And nobly plain, the manly Doric rose;
> The Ionic then, with decent matron grace,
> Her airy pillar heaved; luxuriant last,
> The rich Corinthian spread her wanton wreath."

To the three Greek orders, the Romans added two others: the Tuscan, which was a variation on the Doric, or rather a corruption of it; and the Composite, which was a combination of the Ionic and Corinthian, the proportions and general character of the Corinthian being retained, but the Ionic volutes being substituted for the Corinthian leafage. As the trunks of trees placed upright, so as to support the roof, unquestionably led to the introduction of the stone pillar, there seems to be almost as little doubt that the capital was suggested by the boughs with which such trees might be supposed to be surmounted, or the garlands with which on festive occasions they were probably encircled and crowned. At first, when the power of working in stone was limited, imitation of foliage was scarcely attempted; but the original idea being adhered to, it came at last to be carried out with great success in the Ionic and Corinthian capitals of classical architecture, and in all of the more advanced of the Gothic styles.

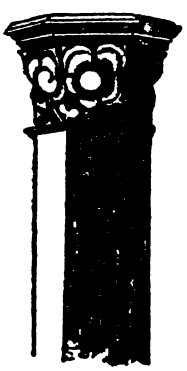


Fig. 7.

The forms of Gothic capitals are so various, that it is altogether impossible to particularize them here. Beginning with the Romanic —which is often nothing more than a modification of the Doric, or a further debasement of the Tuscan, the sides being truncated or flattened, and some of the moldings omitted—they advance very rapidly in adornment; and in the style which we call early English, they already frequently consist of a mass of foliage, cut with great boldness and freedom, so that the stalks and more prominent of the leafage are entirely detached. It is remarkable that, in the decorated style, the capital lost much of the richness which it possessed in the earlier styles, and often consists only of plain moldings, with or without a ball-flower (q.v.), cut on the bell or bowl of the capital. Where foliation is introduced in this style, it is usually worked with greater freedom, and is free from the stiffness which characterizes earlier work. Animals, figures in armor, heads of bishops in miters, and the like, are oftener found in the decorated style, though their introduction was not unknown at a much earlier period. In the perpendicular style, the capitals were stiffer in form, and generally less ornamented than in any of the others; though even here foliage is often introduced, as in the accompanying example from the cloisters of Christ church, Oxford.

The only invariable characteristics of capitals seem to be something like a molding at the upper part of the shaft, more or less complicated according to circumstances, and some sort of abacus (q.v.) or flat portion on the top, on which the architrave rested in the classical orders. These characters belong even to the Egyptian capitals, which in many other respects resemble those of the other styles. The foliation of Egyptian capitals is generally taken from the vegetation peculiar to the banks of the Nile (fig. 2); but the capitals of this, particularly in its later examples, were infinitely varied both in decoration and in form.

COLUMN, in military evolutions, is a mass of soldiers several ranks in depth, presenting a formation different from that which arises from spreading them out *in line*. There may be columns of brigades, of regiments, of battalions, or of companies; presenting a front of limited width, but a depth depending on the number of elements in

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the column. If a battalion consists of 10 companies, then a "battalion in C." has all the companies posted one behind another. According to the density of the C., it is called *open* or *close*. In a battalion, when the distance between any one company and the one immediately before it is such as to admit of their wheeling into line, the formation is called *open* C.; when the distance between the front rank of one company and the rear rank of the one before it is only a few yards, it is *close* C.; when intermediate between these two, it is *half-distance* column. The relative advantages of C. and *line*, in drawing up troops for action, are among the matters closely studied by the commanders of armies: the French, as a general rule, have rather favored the formation in C.; the English, that in line. Sometimes the name C. is given to that which, in effect, is a small army.

CO'LURE. See ARMILLARY SPHERE.

COLUSA, a co. in n. California, between the Sacramento river and the coast range of mountains; 2450 sq.m.; pop. '90, 14,640. The surface is rough; quicksilver, sulphur, and salt are found. Agriculture is the chief business. Co. seat, Colusa.

COLU'TËA. See SENNA.

COLVIN, SIDNEY, b. Surrey, England, June 18, 1845; educated at Trinity college, Cambridge; elected Slade professor of fine arts, 1873, 1876, 1879, 1882, and 1885; appointed director of the Fitzwilliam museum, Cambridge, 1876, and keeper of the department of prints and drawings in the British museum, 1884; edited *Selections from the Writings of Walter Savage Landor* (1884); and author of *Landor* (1882) and *Keats* (1886), both in the *English Men of Letters* series.

COLVOCORESSES, GEORGE MUSALAS, 1810–72; b. island of Scio, Greece; entered the U. S. navy, 1832; took part in the Wilkes' exploring expedition, 1838–42; and was retired, 1867.

COLWELL, STEPHEN, 1800–72; b. Brooke co., Va.; author; was graduated at Jefferson college, Pa., in 1819; admitted to the bar of Virginia in 1821; practiced in Pittsburg till 1831; then engaged in mercantile business in Philadelphia, and began writing for the press, particularly on political and social science. He gathered a large library on his favorite subjects, and used much of his wealth in promoting charitable and educational enterprises. Besides notable contributions to commercial and financial periodicals, he published, among other works, — *The Relative Position in our Industry of Foreign Commerce, Domestic Protection, and Internal Trade* (1850); *Politics for American Christians* (1852); *Position of Christianity in the United States in its Relation with our Political System and Religious Instruction in the Public Schools* (1855); *The South: a Letter from a Friend in the North with reference to the Effects of Disunion upon Slavery* (1856); and *The Ways and Means of Commercial Payment* (1858).

COLYM'BIDÆ, a family of web-footed birds, distinguished by short wings, legs placed so far back that the bird always assumes an erect position when standing, broad flat tarsi (*shanks*), and a compressed bill, pointed at the tip. They are all extremely aquatic in their habits, and possess great powers of diving as well as of swimming. Some of them have all the front toes perfectly webbed, as the loons or divers (*colymbus*); others have the feet lobed, each toe with a separate membrane, as the grebes (*podiceps*). These are the two principal genera. The guillemots (*uria*) seem to connect this family with the *alcadæ*.

COL'ZA. See RAPE.

CO'MA, a Greek word used in medicine, to signify a state of more or less profound insensibility allied to sleep, but differing from natural sleep in its characters, as well as in the circumstances under which it occurs. In C., the patient lies on his back, and is either simply insensible to external impressions, or has a confused and dull perception of them, with restlessness and low delirium (q.v.). The former kind of C. occurs in apoplexy and epilepsy, and also in many other organic diseases of the brain and its membranes, of which, indeed, it may be said to be the natural termination. It is also seen in narcotic poisoning, and most characteristically in poisoning by opium (q.v.). In the most fatal forms, the breathing is very slow and noisy (snoring or stertorous), accompanied with puffing of the cheeks; the pulse is at first strong and regular, afterwards feeble; there is often lividity; and the pupils are either contracted or excessively dilated, but in either case immovable, and totally insensible to light. In the second variety of C., there is perpetual restless delirium, without enough of sensibility to lead to spontaneous and regular voluntary movements; the patient mutters slightly, and grasps feebly and without purpose at any object in his way; the pupils are commonly contracted, and the tongue is apt to be dry and brown. This kind of C. is mainly seen in many fevers, and forms one of the modes of their fatal termination. The treatment of C. is that of the disease or accident leading to it. Where there is a reasonable chance of recovery, the patient must be roused to consciousness as much as possible, either by frequent movements or strong impressions on the skin, or by the use of galvanism, so as to maintain the respiration. See OPIUM. Blistering of the head is also sometimes resorted to with good effect

CO'MA BERENI'CES (Lat. Berenice's hair), a small and close cluster of stars near the equinoctial colure, s. of the tail of the Great Bear.

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COMAC'CHIO, a fortified town of central Italy, in the province of Ferrara, 19 miles n. of Ravenna and 3 miles from the Adriatic. The lagoons, or marsh, in the midst of which it is situated, have a circumference of about 87 miles and comprise 40 basins surrounded by dykes. They are all connected with the sea. The situation is very favorable for the manufacture of salt, large quantities of which are produced each year. C. is the seat of a bishop. It is noted for its very extensive eel fisheries and eel breeding. A series of canals lead from the Adriatic and admit the fry of the eel, mullet, sole, and other fishes into the lagoons, where they are fattened and soon attain a marketable value. Pop. about 10,000.

COMAL', a s.w. co. of Texas, on the Cibolo river, and intersected by the Guadalupe; 580 sq.m.; pop. '90, 6398, inclu. colored. The surface is mountainous in some parts, and about two-thirds is covered with live oak and mosquito. The greater portion of the people are Germans, and agriculture is their chief occupation. Co seat, New Braunfels.

COMA'NA, a city of Cappadocia, in a deep valley of the Anti-Taurus range, through which the river Sarus flows. C. was celebrated in ancient times as the place where the rites of the goddess Ma (the Greek Enyo) were celebrated, with much solemnity and great magnificence, in a spacious and sumptuous temple, to which the city was scarcely more than an appendage. It was governed by the chief priest, who took rank next to the king. In Strabo's time, more than 6000 persons were engaged in the services of the temple.

COMANA, an ancient city of Asia Minor, on the river Iris in Pontus. It was an important commercial city, and the seat of the worship of the goddess of the moon. Ruins of it are still to be seen near the village of Gumenek.

COMANCHE, a co. in s.w. Kansas, bordering on the Indian territory; 795 sq. m. Pop. '90, 2549. Co. seat, Coldwater.

COMANCHE, a co. in n.w. Texas on the Leon river; 960 sq.m.; pop. '90, 16,393, inclu. colored. The surface is undulating and well timbered. Stock raising is the leading business. Co. seat, Comanche.

COMANCHES, American Indians, of the Shoshone family, known to the French as Padouques. When first known to Europeans, they occupied the regions between the upper waters of the Brazos and Colorado on one side, and the Arkansas and Missouri on the other. In 1783, they were brought to nominal submission by the Spanish general Anza, who killed 30 of their chiefs; but they again became troublesome, and continued to harass the district of Texas until they were settled in a reservation. In 1872, a portion of the tribe known as the Staked Plain Comanches had to be reduced by military measures. In 1890, there were 1598 C. in the Indian Territory reservation.

COMAT'ULA. See CRINOIDEÆ.

COMAYA'GUA, a department in Honduras 4800 sq.m.; pop. about 70,000. The province occupies the w. central portion of the republic. The soil is rich, and well adapted to the cultivation of tropical vegetation. There are silver and copper mines, and various other minerals; and of timber there are pine, oak, mahogany, cedar, lignum vitæ, etc. In the mountains in the s.e. part of the province is a considerable population of Indians who are descended from the Lencas. The province is famous for raising superior breeds of cattle.

COMAYA'GUA (formerly VALLADOLID LA NUEVA), chief city of Honduras, Central America, 190 m. e. of Guatemala, in a fine but unhealthy valley, 1800 ft. above the sea, on the right bank of the Humuva, which flows into the Pacific. The city was founded in 1540, is the see of a bishop, has a cathedral college, ecclesiastical seminary, several convents, and a rich hospital. Pop. '93 est. 10,500; it was 18,000 previous to 1827, when the city was burned by the monarchical faction of Guatemala, and has never since wholly recovered.

COMB (Sax. *cumb*). Combs seem to have been used by the ancients rather for adjusting than for fastening the hair, the pin or bodkin (*acus*) having been chiefly employed for the latter purpose. Both the Greek and Roman combs were generally made of boxwood, which was obtained from the shores of the Euxine; but latterly, ivory combs came into general use amongst the Romans, as they had long before been amongst the Egyptians. The precious metals were also used for the purpose, as we may infer from the golden combs ascribed to the goddesses; but this was probably rarer in ancient than in modern and mediæval times, from the circumstance of the C. not having been then used as an ornamental fastening. Of the early use of gold combs in Great Britain, we have a monument in the well-known ballad of *Sir Patrick Spens:*

> "O lang, lang may their ladyes sit,
> Wi' their gawd kames in their hair."

An ancient Irish long rack C. is in the museum of the royal Irish academy. The sides are hog-backed, and between them are set the pectinated portions, varying in breadth from half an inch to an inch and a quarter, according to the size of the bone out of which they were cut. The whole is fastened together with brass pins riveted. By this contrivance, any damaged portion could easily be replaced.

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Combs are made of tortoise-shell, ivory, horn, wood, bone, metal, and India-rubber. The material is first made into plates of the size, shape, and thickness of the C., and then the teeth are cut. The old method of cutting the teeth is by the *stadda* or double saw, which has two blades of steel set parallel to each other, with a space between them equal to the thickness of the intended tooth. Combs with 50 or 60 teeth to the in. may be cut in this manner. The teeth are then thinned, smoothed, and finished by means of thin wedge-shaped files. Instead of hand-saws, circular-saws of similar construction have been more recently used.

Many combs are now made by a method called "parting." By the processes of cutting above described, the material corresponding to the spaces between the teeth is of course wasted: by the method of parting, this is made available to form the teeth of a second comb. The plate of horn, tortoise-shell, etc., is cut through by means of a stamping-cutter, consisting of two thin chisels inclined to each other, which represent their edges; between these, and connecting the ends is a small cross-chisel. When this compound cutter descends with sufficient force upon the plate it will cut one of the teeth. By simple machinery, the table carrying the plate is made to advance a distance equal to the thickness of one tooth while the cutter is rising, and thus the successive cuts are made. A slight pull is now sufficient to part the plate into two combs, the teeth of which only require filing and finishing.

India-rubber combs, now so extensively used, are manufactured by pressing the caoutchouc to the required form in molds, and "vulcanizing" or combining it with sulphur afterwards. By this means a high degree of hardness can be obtained.

COMB, or COOMB, an old corn measure, containing four bushels. In many localities, hollows or valleys among hills are called COMBS or COOMBS (W. *cwm*). The word is allied to the Gr. *kymbos*, a cavity; *kymbe*, a vessel.

COMBACO'NUM, a t. in s. India, 20 m. from Tanjore, and 30 m. from the sea; pop. 40,000. It is a large town, with wide streets, and is adorned with pagodas, gateways, and other edifices of considerable pretension. The gate pyramid is a building of 12 stories rising more than 100 ft., and is ornamented with a profusion of figures of men and animals done in stucco. One of the water tanks in the town is reputed to be filled with water taken from the Ganges once in 12 years, by a subterranean passage 1200 m. long. There is considerable trade, and weaving is one of the chief industries. The city was once the capital of the Chola race, an old Hindu dynasty.

COMBAT, SINGLE, the "Holm-gang," or island duel of the old Norsemen. A great many quarrels were settled by single combat, when, to guard against interference, the principals went alone to some small island (or holm), and there settled their quarrel by strength and skill. The idea is as old as war. In the Bible we read of Goliath challenging any Israelite to single strife. In the Iliad, Ajax challenges any opponent, and furthermore defies heaven. It was not uncommon in England, and was particularly invoked in charges of treason. The idea finds its modern and despicable expression in dueling.

COMBE, ANDREW, M.D., brother of the following, was b. in Edinburgh, Oct. 27, 1797. He studied medicine there and at Paris, and in 1823 commenced to practice in his native city. In 1836, he received the appointment of physician in ordinary to the king of the Belgians, but his delicate health prevented him from retaining this office; and on returning from Brussels, he continued to act only as consulting-physician to his majesty. Afterwards, he became one of the physicians in ordinary to queen Victoria in Scotland. He died at Edinburgh, Aug. 9, 1847. His principal works are—*Observations on Mental Derangement* (1831); *The Principles of Physiology applied to the Preservation of Health*, etc. (1834; 15th ed. 1860); *The Physiology of Digestion considered with Relation to the Principles of Dietetics* (1836; 10th ed. 1860); and *The Management of Infancy, Physiological and Moral* (1840, 9th ed. 1860), revised by sir James Clark; 10th ed. 1870). Mild, benevolent, and wise, Andrew C. obtained the esteem and admiration of all who could appreciate purity and excellence of character. In his *Life and Correspondence*, published by George Combe in 1850, we find not only a vivid picture of the man, but an example of patient adherence to physiological principles in the treatment of a delicate constitution, with the result of prolonging a useful life far beyond what he had ventured to hope for. His death was probably hastened by exposure to the poisonous air of an emigrant ship, in which he made a voyage to America; the experience gained on this occasion led him to proclaim, through the *Times*, the urgent necessity of a law regulating the sanitary arrangements in emigrant vessels. The long letter which he wrote on this subject appeared on Sept. 17, 1847, a month after his death, and erelong the act 12 and 13 Vict. c. 23, provided a remedy for the evil. Dr. C. also exerted himself successfully for the improvement of medical education. A list of his contributions to the *Phrenological Journal* and the *British and Foreign Medical Review* is appended to his *Life*. His character as a man, a physician, and a writer, is affectionately depicted by his friend sir James Clark, in an introduction to the 9th edition of *The Management of Infancy*.

COMBE, GEORGE, a well-known phrenologist and moral philosopher, was b. Oct. 21, 1788, in Edinburgh, where he was educated. Entering the legal profession, he became

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a writer to the signet in 1812, and continued to practice until 1837, when he resolved to devote himself to scientific pursuits, for which he had always manifested a predilection. As early as 1816, he made the acquaintance of Dr. Spurzheim, while the latter was on a visit to Scotland, but at first regarded his phrenological system with aversion. Investigation, however, convinced him that phrenology was based on fact. The result was his *Essays on Phrenology* (1819). Five years later, appeared his *System of Phrenology*, which became very popular, and reached a fifth edition in 1843; besides being reprinted in America, and translated into French and German. But his most important production is *The Constitution of Man considered in Relation to External Objects* (1828; 9th ed. 1860). C.'s doctrines were violently opposed, being considered by many as inimical to revealed religion; but now that the heat of controversy has cooled, it is seen that, in their main aspects, they were not liable to the objections urged. The work had a very extensive circulation and was translated into foreign languages. C. contributed largely to the *Phrenological Journal* (20 vols., 1824–47). He traveled in Germany and America, and published *Notes* of his experiences. His death occurred on 14th Aug., 1858. Mr. C. married, in 1833, Cecilia, daughter of the celebrated Mrs. Siddons, by whom he was survived. Besides the works mentioned, he wrote *Elements of Phrenology* (1824; 9th ed. 1862); *Lectures on Popular Education* (1833; 3d ed. 1848); *Moral Philosophy* (1840; 3d ed. 1846); *Life and Correspondence of Andrew Combe, M.D.* (1850); *Principles of Criminal Legislation and Prison Discipline* (1854); *Phrenology applied to Painting and Sculpture* (1855); and *The Currency Question considered in relation to the Bank Restriction Act, 7 and 8 Vict. c.* 32 (1855; 8th ed. 1858), etc. The latest of his works — in which the importance of natural religion, and the duty and advantage of obedience to its precepts, are eloquently enforced — is on *The Relation between Science and Religion* (1857). Endowed with great activity and an earnest apostolic spirit, C. was fond of lecturing on his favorite subjects, and delivered many successful courses not only in various parts of the United Kingdom, but in the United States, and even in Germany. See the *Life* by Charles Gibbon (1878).

COMBE, WILLIAM, English author, 1741–1823, was educated at Eton, and, after rapidly spending a small fortune that had been left him, settled in London as a law student and hack-writer. In 1776 he published his *Diaboliad*, a satire full of sharp personal attacks. By contributions to periodical literature he earned a precarious living and spent a good deal of his time in prison. About the year 1789 he was in receipt of a pension of £200 from Pitt. He wrote, among other works, *The Devil on Two Sticks in England;* the text for Boydell's *History of the River Thames;* and probably a satire called *All the Talents*, which passed through 20 editions. His most famous work, however, is *Three Tours of Dr. Syntax*, written in verse and humorously illustrated. This is a comic account of the adventures of a pedagogue, and contains many amusing lines and bright situations. Other volumes of verse by him were *The Military Adventures of Johnny Newcome* (1815); *The English Dance of Death* (1815–16); *The Dance of Life* (1816–17), etc.

COMBINATION, the act of two or more persons in uniting for some common purpose. If this purpose be lawful in itself and be attained or striven for by lawful means, the combination is, of course, legal in character and often also praiseworthy in every way. But a combination to attain an unlawful end, or to attain a lawful end by illegal means, becomes a conspiracy, and brings those thus associated under the condemnation of the law. If the combination be one to carry out an actual crime, the conspiracy thus formed is an indictable offense; if the combination be to carry out something not actually a crime, but injurious, immoral, or opposed to the public welfare, it is usually held to be a conspiracy in fact and may be made a misdemeanor by statute. The term combination in economical and political literature is most commonly used to designate some particular form of association into which either employers or employés have entered with a view to affect wages, hours of employment, conditions of labor, apprenticeship, or for mutual defense or offense in the relations existing between labor and capital. A most unjust discrimination was formerly made by English law between such combinations as these and those formed for ordinary business, social, or political purposes. It was indeed even made a crime, punishable by imprisonment, for a workman to enter in any way into a combination to affect wages or hours of work. This seems to have been a survival of still earlier labor laws in which severe fines were laid on craftsmen or mechanics who refused to give their services at a fixed price laid down by the statutes. Laws of this kind of course attempted impossibilities, and contained in themselves the elements of their own defeat. This was also true of the laws referred to imposing fine and imprisonment for the offense of unitedly demanding an increase of pay. The associations of trades and laborers in existence previous to the repeal of this law (1825) were from their very secrecy more dangerous and more inclined to cruel and vicious practices. As the law now stands—the English law of 1825 has been much broadened by later legislation—in all English speaking countries combinations of labor such as trades-unions, and combinations of employers as well, are considered by the law in precisely the same light as other lawful unions. The one principle involved, the one question to be determined, is, whether the object and the means employed are lawful. The latest decisions of the courts and the trend of legislation strive to define constantly with greater clearness the line which separates the lawful exercise of one's own rights from the infringement upon those of others. A combination of employés to secure higher wages is unquestionably

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lawful; a refusal by such a united body to deal with or work for those who do not accept their conditions is also lawful; concerted action by the laborers to induce others to unite with them is, again, lawful; it is only when such concerted action is accompanied with violence, with threats, or with an expressed determination to injure the persons not joining the combination, that it becomes an unlawful conspiracy. The law on this subject has been clearly defined by Judge Grosscup of the United States Court in his charge to the Federal Grand Jury at Chicago, in July, 1894, on the occasion of the great Pullman strike of that year. The development in recent years of combinations of producers or manufacturers to control the entire sale of an article, to regulate its price, and to crush single competitors, has brought out some interesting and important decisions in regard to this form of combination. See TRUSTS. It may be said here briefly that courts and legislators seem to be moving toward the ground that such a combination of capital may constitute a monopoly of a kind so directly detrimental to public interest and public policy as to require from the law a recognition in a special way of this injurious tendency. See BOYCOTT; TRADES UNIONS; STRIKES.

COMBINATION, LAWS OF, in chemistry. See ATOMIC THEORY.

COMBING, of wool, cotton, etc. See CARDING.

COMBS, LESLIE, 1793–1881; b. Clark co., KY.; distinguished himself in the war of 1812, and was commissioned cap., 1813. In 1836 he raised a regiment at his own expense, to assist Texas in her struggle for independence. He was a leading lawyer in his state, and an eloquent public speaker. In the presidential campaign of 1844, he was an ardent supporter of Henry Clay.

COMBUSTION is the term applied to the process of burning, which usually consists in the oxygen of the air uniting with the constituents of the combustible substance. Thus, the C. of coal is due to the oxygen of the air passing into a state of chemical union with the carbon and the hydrogen of the coal, forming carbonic acid, CO_2 and water-vapor, HO. Such chemical combinations are always accompanied by the production of more or less heat, as in the case of decaying wood and other vegetable matter; but it is only when the action is so rapid as to evolve intense heat accompanied by light, that the process is called burning or combustion. Though the gaseous oxygen has as much to do with the process as the more solid material, coal, wood, paper, or cloth, yet the latter is alone styled the *combustible* or *burning body*, whilst the oxygen is invariably named the *supporter* of combustion. A few substances burn at ordinary temperatures, such as phosphorus, which glows when exposed to the air; but the generality of substances, such as wood, coal, etc., require to be raised in temperature or be set fire to before they possess the power of combining with the oxygen of the air. The amount of heat given out by the various combustibles when burned, is capable of being measured, and is definite. The same weight of the same combustible invariably evolves the same amount of heat during its complete C.; but different combustible substances give off different amounts of heat. The mode in which the heat evolved may be measured, is either (1.) To observe the quantity of ice which a given weight of the combustible will melt when burning; (2.) To notice the weight of water which the combustible will convert into steam; or (3.) To estimate the number of pounds of water which the burning body will raise from 32° to 212° F. The last plan is the more easily managed and accurate, and serves as the index in the following table, which gives the number of pounds of water raised from 32° to 212° F. during the C. of one pound of each of the burning bodies:

Charcoal, pure	78	lbs. of water.
" from wood	75	"
Wood, dried	36	"
" undried	27	"
Coal, bituminous	60	"
Turf and peat	25 to 30	"
Alcohol	67½	"
Olive oil, wax, etc.	90 to 95	"
Ether	80	"
Hydrogen	236½	"

The amount of heat evolved appears, however, to be proportional to the quantity of oxygen required to burn the various combustibles. Thus, when a similar volume of oxygen gas, or even ordinary air, is allowed to flow against the various combustible substances, the following results are obtained:

One lb. oxygen combining with	Raises from 32 to 212 degrees F.
Hydrogen	29½ lbs. of water.
Charcoal	29 "
Ether	28 "
Alcohol	28½ "

While the absolute amount of heat evolved during the C. of any burning body is the same, yet the sensible heat may vary according to the rapidity of the process. Thus,

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when phosphorus is exposed to the air at ordinary temperatures, it very slowly combines with oxygen, and gives out little heat at any one moment, but it is diffused over a great length of time; whilst if the phosphorus is set fire to in the air, it burns vividly, and gives out much heat and light for a short time; and still further, if the burning phosphorus be placed in pure oxygen, it enters into most vivid C., and evolves a most intense heat and brilliant light for a still shorter time. In the latter instances, the heat evolved at any one moment is greater, because more rapid, than that given off at the same time during the slower process of C.; but when allowed to proceed to a termination, there is as much heat produced during the whole time occupied in its development. The same remark applies to the coal placed in a furnace. So long as the door of a furnace is open, and there is little draft of air through the fuel, a moderate amount of heat is evolved, which may last for several hours; but when the door is shut, and much air is drawn through the coal, the latter is more quickly burned, and more heat is evolved during a shorter period of time than before, but in the long-run there is the same amount of heat evolved.

COMÉDIE FRANÇAISE, or THÉÂTRE FRANÇAIS, the national theatre of France, subsidized by the state for the advancement of dramatic art. Its history dates officially from 1680, when Louis XIV. amalgamated by a decree the two rival companies of the Hôtel de Bourgogne and of the Hôtel Guérigaud, the latter being a fusion after Molière's death in 1673 of the Théâtre du Marais and the Troupe de Molière. In 1682, the king granted to his comedians an annual pension of 12,000 livres or francs (about $2,400)—their first subsidy. In 1689 they took the name of La Comédie Française, and played under it down to the great revolution with a succession of such artists as Baron, Adrienne Lecouvreur, Le Kain, and Mdlle. Clairon. On the performance of Chénier's play of Charles XI. in 1789, violent political discussions arose among the performers, and they ultimately split into two sections: the Republican party under the young tragedian Talma (q. v.) establishing a new theater under the name Théâtre de la République; while the Royalist section remained in their old quarters under the title Théâtre de la Nation. In Sept., 1793, the latter was suddenly closed by order of the "Comité de Salut Public," and the players imprisoned, though afterwards gradually released. The Comédie Française is still managed by the regulations dictated by Napoleon at Moscow, modified by resolutions passed in 1850 and 1859. The *sociétaires* are shareholders who divide the profits of the company among its members according to certain rules. To be admitted as *sociétaire* an artist must have served in the theatre as *pensionnaire* for one year, and all *sociétaires* must be re-elected at the end of ten years. After twenty years of service they are allowed to retire with a pension of 4,000 francs. The annual sum received from government is 240,000 francs, and the theater, being removed from the fear of temporary pecuniary failure, exists in no sense as a mere money speculation, but serves as an educator of public taste and a provider of adequate and systematic training for young artists.

COMEDY. See DRAMA.

COME'NIUS, JOHN AMOS, the most distinguished educational reformer of the early part of the 17th c., was b. on the 28th of Mar., 1592, according to some, at Comna, near Brünn; according to others, at Niwnitz, in Moravia. His parents belonged to the community of the Moravian Brethren. C. studied at Herborn, and then at Heidelberg, after which he traveled through Holland and England, and at last settled at Lissa, in Poland, where he was chosen bishop of the Moravian Brethren. Here he made a careful study of educational methods, and wrote a treatise on the subject, published later under the title of *Magna Didactica* or *Great Didactic*. In 1631 he published his *Janua Linguarum Reserata*, which was translated into many European, and even into some Oriental languages. In this work, he points out a method of learning languages, new at that time, which may be called the intuitive or perceptive system, in which the pupils were taught by a series of lessons on subjects easily understood or appreciable by the senses—such as natural history, the sciences, different trades and professions, etc. C. also published about the same time the *Ratio Disciplinæ Ordinisque Ecclesiæ in Unitate Fratrum Bohemorum* (1632), republished with remarks by Budæus (Halle, 1702); and his *Pansophiæ Prodromus*. In 1641, C. was invited to England, to assist in reforming the system of public instruction; but as the breaking out of the civil war prevented the execution of this design, he went to Sweden, where he was patronized by Oxenstiern, who gave him a commission to draw up a plan for the organization of schools in Sweden, which he completed at Elbing, four years afterwards. It was published at Lissa under the title of *Methodus Linguarum Novissima*. He next went to Hungary for a similar purpose. Here he composed his celebrated *Orbis Sensualium Pictus*, or The Visible World (Nürn. 1658), the first picture-book for children, which has been often reprinted and imitated. Finally he settled in Amsterdam, where he published several other works. C. died at Naarden, on the 15th Oct., 1671. In the latter years of his life, C. gave way to fanaticism, misinterpreted the Revelation of St. John to suit his fancies of the existing state of Europe, and expected the millennium in 1672. An interesting account of the wanderings and sufferings of C., and of his great services in the cause of popular educa-

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tion is given in von Raumer's *Geschichte der Pädagogik;* Laurie's *Comenius* (1881), and Payne's *Lectures on the History of Education* (1892). In 1891 an association called the Comenius Society was formed for the purpose of furthering the study and publication of his works.

COMES, an ancient officer, with territorial jurisdiction. See EARL.

COMES, CONSEQUENT, OR **ANSWER**, in music is the second necessary part of a fugue, in which the second voice repeats at the interval of a fourth or fifth, the subject or "dux." See FUGUE.

COMES, JUAN BAPTISTA, a Spanish composer of music, was born in the province of Valencia about 1560, and became chapel-master of the cathedral in that city and of the Church del Patriarca at Valencia. He enjoyed great popularity, which, judging from his works preserved at Valencia and in the Escurial, was well deserved. Among his compositions was a set of Christmas-Day responses for three choirs, in twelve parts.

COMES NATALIS. The Latinized form of the name NOËL CONTI, a very learned Italian scholar of the sixteenth century, who was born at Milan. He was the author of numerous odes and epigrams in Latin, of a treatise on classical mythology, and of a history of the times in which he lived. He died at Venice about 1581. Some writers give his Christian name as Natal, and the date of his death as 1590.

COMESTIBLES. See DIET, FOOD AND DRINK, SANITARY SCIENCE.

COMESTOR, PIERRE, a French theologian of the twelfth century, who was born at Troyes, and in 1164 became the head of the Theological School at Paris. His great work, *Scholastica Historia*, was received with much favor, and was long regarded as a standard treatise on theology. His Latin name *Comestor*, "devourer," was given him because of his having *devoured* so many books. He died about the year 1180.

COMET, CHARLES JEAN BAPTISTE, a French physician and medical writer, was born at Paris in 1796, and died there in 1869. He was the author of many treatises and monographs on medical topics.

COMET. The name of an old English game of cards.

COMET. The word C. is derived from the Gr. *kómē*, hair, a title which had its origin in the hairy appearance often exhibited by the haze or luminous vapor, the presence of which is at first sight the most striking characteristic of the celestial bodies called by this name. The general features of a C. are—a definite point or nucleus, a nebulous light surrounding the nucleus, and a luminous train preceding or following the nucleus. Anciently, when the train preceded the nucleus—as is the case when a C. has passed its perihelion, and recedes from the sun—it was called the beard, being only termed the tail when seen following the nucleus as the sun is approached. This distinction has disappeared from all modern astronomical works, and the latter name is given to the appendage, whatever its apparent position. Neither this luminous attendant, the tail, nor the nucleus, is now considered an essential cometary element, but all bodies are classed as comets which have a motion of their own, and describe orbits of an extremely elongated form. There are several plain points of difference between comets and planets. The planets move in the same direction, from w. to e., which is astronomically called "direct motion;" but the movements of comets are often from e. to w., or retrograde. The orbits of all the planets are confined to a zone of no great breadth on either side of the ecliptic; but the paths of comets cut the ecliptic in every direction, some being even perpendicular to it. The orbits of all the planets are nearly circular; or, more properly speaking, are ellipses of very small eccentricity. The orbits of comets, on the other hand, present every variety of eccentricity, some of them being ellipses or elongated closed orbits of various degrees of elongation; others, hyperbolas; while the majority have a form of orbit not differing sensibly from the parabola, which is the limiting form of curve to which both the ellipse and hyperbola approximate, under given conditions.

Any attraction, however, of an extraneous body interfering with the attraction of the sun might change the orbit from the ellipse to the hyperbola, and *vice versâ*, or from the parabola to either. As, however, there is only one parabola corresponding to infinite sets of ellipses and hyperbolas, an interfering cause is not likely to change the orbit from an ellipse or hyperbola to the parabolic form. Of about 200 comets whose orbits have been obtained with more or less accuracy, 40 appear to have described ellipses, 7 hyperbolas, and 150 orbits that cannot be distinguished from parabolas.

The discovery that comets are celestial bodies, extraneous to our atmosphere, is due to Tycho Brahé, who ascertained the fact by observations of the C. of 1557. Newton succeeded in demonstrating that they are guided in their movements by the same principle which controls the planets in their orbits; and Halley was the first, by determining the parabolic elements of a number of comets from the recorded observations, to identify the C. of 1682 with one which had been observed in 1607 and the observations recorded by Kepler and Longomontanus, and also with a C. observed in 1531 by Apian, at Ingoldstadt, and thus confidently to predict the return, at the end of 1758 or beginning of 1759, of a C. which would have the same parabolic elements. These parabolic

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elements are elements of a parabola nearly coincident with the elongated elliptic orbit of the comet. They are—1. *The inclination.* 2. *The longitude of the node.* These two determine the plane of the orbit. 3. The longitude of the *perihelion*, or point of nearest approach to the sun. 4. The perihelion distance, or nearness of approach to the sun, 5. The direction of motion, whether *direct* or *retrograde.*

To determine these parabolic elements, three observations of the C. are sufficient; and by a table of such elements deduced from the recorded observations, it is possible at once to ascertain whether any newly observed C. is identical with any that have been previously observed. To predict, however, with accuracy the time of the return of a C., a much more accurate calculation must be made of the orbit, taking into account the perturbations of the planets to whose influence it is subject. This difficult problem was solved, in the case of Halley's C., by the joint work of Laland, Mme. Lepante, and Clairaut, who announced, in Nov., 1758, just as astronomers began to look out for the return of the C., that it would take 618 days more to return to the perihelion than on the preceding revolution. The perihelion passage was fixed about the middle of April, 1759; but Clairaut distinctly forewarned the world that, being pressed for time, he had neglected small values, which collectively might amount to about a month in the seventy-six years. The C. passed the perihelion on the 12th Mar., 1759, exactly a month before the time announced, but within the assigned limits of divergence from that date. The elements of its orbit proclaimed it to be the C. of the former periods by their similarity. For the next perihelion passage, the different calculations executed by MM. Damoiseau and De Pontécoulant, fixed the 4th, the 7th, and the 13th Nov., 1835. Subsequently, observations indicated the 16th—that is to say, a deviation of only three days from what turned out the most accurate calculation, and a deviation of 12 days from the most remote. We have adverted to the perihelion passages of this C. in 1531, 1607, 1682, 1759, and 1835. It is also now identified with a C. observed in 1456, and one in 1378, recorded by Chinese observations. There are no sufficiently reliable European observations previous to 1456, but it is conjectured by Arago, that this C. is the same with the C. of 1305; that of 1230; a C. mentioned in 1006 by Hali Ben Rodoan; that of 885; finally, a C. seen in the year 52 before our era.

This account of Halley's C. has been given at length, to illustrate the principles on which the calculations are made. There are 19 other comets whose periodicity is established, and whose paths are accurately known:

1. That of Encke, with a short period of 1204 days. Its orbit does not extend so far as the orbit of Jupiter, and a slight acceleration in its periodic times of return has suggested the possibility of the space, within our solar system at least, being occupied by a resisting medium, though of extreme rarity.

2. That of Biela or Gambart, having a period of six years and three quarters. During the visit of this C., in 1846, it was seen to separate into two distinct comets, which kept moving side by side till they disappeared. On the return of the C. in the autumn of 1852, the distance between the two nuclei had much increased. Since then, although twice due, it has not again been seen.

3. That of Faye, with a period of seven years and a half.

The orbits of both these last extend beyond the orbit of Jupiter, but not so far as that of Saturn.

4. That of Winnecke, with a period of 5.6 years.
5. That of Brorsen, with a period of 5.5 years.
6. That of Temple (No. 1), with a period of 6 years.
7. That of Temple (No. 2), with a period of 5.2 years.
8. That of D'Arrest, with a period f 6.4 years.
9. That of Tuttle, with a period of 13.8 years.
10. That of Swift, with a period of 5.5 years.

And nine others which have not yet been observed at more than one perihelion passage.

The above are the only comets whose orbits are considered by astronomers as established, although there are others whose orbits are ascertained with a less degree of accuracy and certainty, requiring the test of future returns to fix their periodicity.

The orbits of forty-three comets appear to be ellipses. These are *probably* periodical. The paths of about two hundred cannot be distinguished from parabolas. These are *possibly* periodical, as the ellipse, when very eccentric, cannot near perihelion be distinguished from a parabola. Only six or seven have orbits possibly hyperbolic.

In the month of June, 1770, Messier discovered a C. which remained visible a long time, and enabled Lexell to ascertain the orbit to be an ellipse whose major axis was only three times the diameter of the earth's orbit, and corresponded to a periodic revolution of 5½ years. This result suggested grave difficulties. It had been found impossible to identify this C. with any previously observed, and yet it was difficult to conceive that a bright C., with so short a period of return, should have previously escaped observation. What was still more remarkable, it was never seen again, though anxiously looked for in the places where Lexell's orbit would have brought it. It became popularly called Lexell's lost C., and gave occasion to many sarcasms by the wits of the day at the expense of astronomers, who had so much boasted of having found the key

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to the cometary movements. In the present day, the explanation is complete. The C. was never seen before 1770, because its orbit previously had been totally different, its nearest point to the sun having been as distant as the path of Jupiter. Its appearance that year arose out of the fact that in 1767 it was in such close contact with Jupiter, moving in the same direction, and nearly in the same plane, that the attraction of this planet entirely changed its orbit. But why has the C. not since been seen? Its passage to the point of perihelion in 1776 took place by day; and in 1779, before another return, it again encountered the vast body of Jupiter, and suffered a fresh orbital derangement, the attraction of the planet deflecting it into more distant regions, and so changing the form of the orbit, that if it had again been visible, it would not have been recognized as identical with Lexell's comet.

The celebrated C. of 1680, which furnished Newton with the occasion for proving that comets revolve around the sun in conic sections, and that, consequently, they are retained in their orbits by the same force as that which regulates the movements of the planets, appears to have been about the most remarkable for brilliancy of any of which we have authentic accounts. This C. is supposed to be identical with the one that appeared about the time of Cæsar's death (44 B.C.), with that which was seen in the reign of Justinian in the year 531, and with another in the year 1106, in the reign of Henry II., the period of revolution, according to the orbit calculated for it by Whiston, being about 575 years. There is, however, some doubt among astronomers as to the real form of its orbit, the one assigned to it by Encke giving it a period of 8,813 years. This C. approached nearer to the sun than any known, except perhaps the C. of 1843, the calculation of whose perihelion distance, from the paucity of observations, has little certainty. The C. of 1680 approached the sun within the 163d of the semi-diameter of the earth's orbit. The tail of a comet is nearly always away from the sun, frequently assuming a curved form. It increases in length with its proximity to the sun, but does not acquire its greatest length till after passing the perihelion. These are usual characteristics of comets, which were exemplified by this one in a remarkable degree. These phenomena might be accounted for if we were to regard the train as vaporization produced by the intense heat to which the body of the C. is exposed in its approach to the sun.

In the present century, the comets most remarkable for brilliancy have been the C. of 1811, 1843, 1858 (Donati's), 1861, 1880, 1881, and the great C. (b), 1882.

Spectroscopic investigation, so far as yet pursued, points to the conclusion that the nucleus is self-luminous, but that the tail shines with reflected light. It has been discovered recently, in determining the tracks of those streams of dark bodies that cause meteoric showers, that some of the tracks coincide with the orbits of well-known comets. From this, it is inferred that star-showers and comets may be only different manifestations of the same thing. See METEORS.

What the matter of the comets consists of is, of course, only a subject for speculation. The composition of the nebulosity and the tail is, at all events, something of almost inconceivable tenuity, as shown by three considerations. 1. Stars seen through them suffer no diminution of brightness, though the light must have to traverse sometimes millions of miles of the cometary atmosphere. 2. Though the thickness of the tail of a C. may be millions of miles, and its length of course much greater, the comets have never been observed to cause any sensible disturbance of the planetary motions, though approaching near enough to be themselves so much affected as to change the entire character of the orbit. 3. The curvature of the tails, and the acceleration of the periodic time, in the case of Encke's C., indicate their being affected by a resisting medium, which has never been observed to have the slightest influence on the planetary periods, though so long observed. Even the nuclei of comets appear to be of extremely small density. This may be inferred, though with less force than regards the tails, from the two last considerations above mentioned; and, moreover, there are reliable accounts of stars of a very low order of magnitude being seen through the nuclei themselves.

Comets have been alternately regarded with terror and with welcome in the popular mind. The appearance of Halley's C., in 1456, just as the Turks had become masters of Constantinople, and threatened an advance into Europe, was regarded by Christendom with a superstitious dread, and to the Ave Maria was added the prayer: "Lord save us from the devil, the Turk, and the comet." At Constantinople, the occurrence of a lunar eclipse at the same time, increased the portentousness of the event. The discoveries of science of the magnitude of the space filled by their bodies, and their prodigious velocity, together with the confessed impossibility of always predicting their approach, produced fears of another kind, which have sometimes been, especially in France, extravagantly exaggerated in the public mind. The groundlessness of such alarms from the extreme improbability of collision with the nucleus, the probable innocuousness of a contact with the extremely attenuated surrounding matter, and, possibly, to the greater part of the world, of a collision with the nucleus itself, will be sufficiently evident from what has been said above. It is probable that already, on many occasions, some of the attenuated vapor in the tail of comets must have come within the earth's attraction, and been absorbed in its atmosphere. Whether the effect is deleterious or salubrious, or whether it has any perceptible influence at all, is only matter of

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speculation. The salubrity of cometary influence is now a popular idea; and the vintages of 1811 and 1858 were favorable seasons, whose produce is often advertised as the C. wines. It is scarcely worth while, however, to follow further speculation on these subjects, and it has been considered preferable to confine this article chiefly to the description of the general characteristics of comets.

COMET-FINDER, a telescope having a wide field of view, but rather low magnifying power, used in searching for comets.

COMFORT, GEORGE FISK, teacher and author, b. New York, 1833; a graduate of Wesleyan University. He was one of the leaders in organizing the American philological association, and also in establishing the metropolitan museum of art in New York. After holding several university positions, he became president of the Southern College of Fine Arts, La Porte, TEX., in 1892. He is the author of text-books for the study of German, and various essays upon linguistic and æsthetic subjects.

COM'FREY, *Symphytum*, a genus of plants of the natural order *boragineæ*, distinguished by a 5-cleft or 5-partite calyx, and a corolla enlarged upwards, its throat closed by awl-shaped scales. The species, which are not numerous, are natives of Europe and the n. of Asia. They are perennial plants of coarse appearance, although occasionally to be seen in flower-borders. *S. officinale* (the COMMON C.) and *S. tuberosum* are natives of Britain, frequent in shady and moist places. *S. officinale* was formerly much esteemed as a vulnerary, on account of its astringency. Its young leaves and its blanched shoots are also occasionally used as boiled vegetables. The prickly C. (*S. asperrimum*), a native of Siberia, 6 to 10 ft. in height, has been highly recommended for feeding cattle.

COMINES, OR COMYNES, PHILIPPE DE, Sieur d'Argenton, a French statesman, and the author of some very interesting and valuable *Memoirs*, was b. at the castle of Comines, not far from Lille, in 1445. After receiving a careful education, he passed into the court of Burgundy about 1466, and attached himself particularly to Charles the bold (then comte de Charolais). In 1472, C., who was anything but punctilious in his notions of honor, entered the service of Louis XI., the rival and enemy of Charles, who immediately covered him with honors, and made him one of his most confidential advisers. He proved himself a very suitable agent for carrying out the designs of the crafty monarch; but after the death of Louis, by his adherence to the party of the duke of Orleans, C. incurred the displeasure of the government of Anne of Beaujeu, and was sentenced to a forfeiture of a fourth of his estates and to ten years' banishment. This punishment, however, does not seem to have been carried out, for after a few years we find C. again employed in important affairs of diplomacy. Though engaged in the service of Charles VIII. and the duke of Orleans, afterwards Louis XII., C. failed to win the confidence of these masters. He died at his castle of Argenton, Oct. 17, 1509. C.'s *Memoirs* are admirably written, and afford abundant proof that he possessed a clear, acute, and vigorous mind. He seems to have looked keenly into the heart of every man who crossed him in life, and with cool, severe anatomy, dissects him for the benefit of posterity. The best edition of his *Memoirs* was edited by Lenglet Dufresnoy (4 vols., London, 1747).

COMI'SO, a t. of Sicily, in the province of Syracuse, about 40 m. w.s.w. of the city of that name. It has paper manufactures, and a pop. of about 20,000.

COMITAN', or COMITLAN, a t. in the state of Chiapas, Mexico, about 40 m. s.e. of San Cristobal. It has a fine church and a convent dedicated to St. Domingo. Agriculture is the chief occupation of the people.

COMI'TIA (Lat. *cum*, with or together, and *ire*, to go) were the legal or constitutional meetings of the Roman people, convened by a magistrate, for the purpose of putting a question to the vote. This definition at least comprehends all the C., except the *C. calata*, where the people were merely present as spectators. There were several kinds of C. (*C. centuriata*, *C. tributa*, etc.) held for different purposes; and according to the mode of constituting the C., the preponderance lay with the patricians or with the plebeians. It was always a fundamental principle of the Roman constitution that the supreme power was inherent in the citizens, though it might be delegated by them to hereditary or to elected magistrates. All important matters, however, had to be brought before the sovereign people, who could either ratify or reject, but without discussion, the proposals made to them. Such, at least in theory, and, during the best days of the republic, in practice also, was the function of these popular assemblies. As may be readily understood, different elements had the ascendancy among the Roman people at different periods of their history. So far as it was possible for a state exposed to so many and such various influences to be conservative of its political traditions, Rome, whether monarchical, republican, or imperial, was essentially so. But, under the force of circumstances, from time to time innovations were introduced which materially altered the position of the two political parties—the patricians and the plebeians—into which the state was early divided, and by whose dissensions it was long distracted, and in none of her institutions can the progress of the struggle between these rising factions be more clearly traced than in the motive and power of those assemblies, or comitia, by which the supreme authority of Rome was in succession wielded. It is

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usual to describe the Roman comitia as of three kinds, named from the mode in which the people were organized and in which they voted—the comitia curiata, or assembly of the curiæ; the comitia centuriata, or assembly of the centuries; and the comitia tributa, or assembly of the tribes. To these some add a fourth, the comitia calata (from calare, to call); but as this assembly had neither political functions nor a separate organization, it is unnecessary to do more than mention the name.

1. Comitia Curiata.—The assembly of the curiæ is believed to have been coeval with the rise of Rome itself, and its origin is therefore rightly ascribed by tradition to the mythical founder of the city. The system seems to have been an essential part of the communities, of which Rome was originally only one. Its primary object cannot now be satisfactorily determined; but the purpose for which it came to be employed is sufficiently clear. From a very early period the Roman curiæ, or "wardships," as they may be called, numbered 30, being 10 for each of the three once independent communities—the Rhamnians, the Tities, and the Luceres—from whose amalgamation the Roman people sprang. At first, these curiæ were probably made up extensively of the freeholders, or patricians, as the freeholders were afterwards designated, on whom devolved exclusively the right and the duty of bearing arms. It has been maintained by some that the class of dependents called by the Roman writers clients, as well as the burgesses or citizens, had a right to vote in the assembly of the curiæ. No direct evidence, however, can be brought forward in support of this supposition, which, in the nature of the case, is highly improbable; and, if allowed to be present at all, they were very likely nothing more than spectators, or, as their name is said to imply, "listeners." In an assembly each had one vote, and determination was by the majority of the individual voters in the different curiæ. As the number of the latter was even, and no provision was made for deciding in case of there being an equal division on any question, it would seem as if this function had not been thought of in fixing the number of the curiæ, or had been subordinated to some other consideration.

2. Comitia Centuriata.—By the operation of obvious causes, a great increase soon took place in the number and influence of the dependent members of the Roman commonwealth. As a natural consequence, the way was paved for a reform of the constitution, though we may well conceive that the step was hastened by the gradual thinning of the ranks of the old freeholders in the incessant wars in which Rome found herself involved with her neighbors. Thus, in the course of time a new class, the plebeians of history, arose out of the clients, preponderating in numbers, and by no means destitute of wealth. Though this class had not, perhaps, the rights of citizens, it was exempt from service in the field; and while the political inferiority of its members must have been galling, their immunity from the chances of war can hardly have been looked upon with equanimity by the ruling faction. It was to redress this twofold grievance that the reform ascribed to king Servius Tullius is generally believed to have been effected. But the whole scheme was one skillfully devised to assign duties to the plebeians rather than to bestow upon them rights, and it was evidently the work of a statesman who was in the interest of the patricians. The chief authorities for the details of the arrangement are Livy and Dionysius, whose accounts, though they differ in some particulars, agree in the main. We must bear in mind, however, that both of them describe the assembly of the centuries rather as it existed in their own day than as it was first constituted. Livy gives the whole number of the centuries as 194; Dionysius makes them 193. The voting in the assembly was by centuries, each possessing a collective vote exactly as in the case of the curiæ. It was so arranged that the 18 centuries of equities and the 80 centuries of the first class voted first. If they were agreed upon a question at issue, the other side were not called upon to vote at all. As the centuries, though nominally "hundreds," probably contained in the first class fewer, and in some of the other classes certainly many times more than that number, it is plain that in the assembly by far the largest share of power was retained in the hands of the wealthy, of whom the original burgess element would long form the main portion. How far we have in this scheme merely a modification of an earlier arrangement, there are no means of determining. As Mommsen remarks, it is more than probable that the original assessments were laid upon land. Be this as it may, the Servian reform was originally a new military rather than a new political organization, its author intending that the privileges of the patricians assembled in the curiæ should remain as before. But its results were different from what had been anticipated. By a process easily understood, the rights of the curiæ gradually passed to the centuries. The assembly of the former continued, indeed, to meet, but the assembly of the latter became thenceforth the chief guardian of the rights of the Roman people.

3. Comitia Tributa.—The further development of the democratic element in the Roman constitution, consequent on the change just described, soon led to a demand for greater changes in the same direction. The tribunes of the people, now the acknowledged leaders of the democracy, took advantage of an ancient division of the original territory of Rome into tribes, to give greater prominence to this element than it had yet possessed. These tribes, 30 and afterwards 35 in number, which, as is supposed by some, had already supplied a basis for the arrangement into curiæ as well as classes, seem to have at first existed for purely local purposes. But the leaders of the people succeeded at length in forming them into a political union entitled to exercise certain func-

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tions, chief among which was the election of the inferior magistrates, and the approval and rejection of such legislative measures as affected the interests of the plebeians as a class. Whether the assembly of the tribes was composed of plebeians only, or of all, whether patrician or plebeian, living within certain limits, has not been ascertained; but the balance of opinion inclines to the hypothesis that it consisted of plebeians alone. After the rise of this new power, it became a matter of great difficulty to determine what questions were to be submitted to the tribes, and what to the centuries, each claiming to be the real representatives of the whole body of the people. A solution appears to have been sought and found in some combination of the two rival assemblies. At what time this change took place, and what was its exact nature, are matters which remain involved in the greatest obscurity. All that can be said is this: the plebeians, either by means of their own assembly, or by some use of it to counterbalance the power of the patricians in the assembly of the centuries, ultimately gained what they had so long aimed at—a position of supreme importance to the republic. When the wealthier classes found their influence thus neutralized, they ceased to attend the comitia altogether, and the popular will was represented by the lower classes alone. A period of moral and political corruption followed, ending in the military despotism of the Cæsars. Under the first emperors the form of calling the assemblies together was still observed, but the people met no longer to control their chief ruler, but simply to receive information as to what he had done. Even this form was by and by discontinued, and in the last days of the empire the comitia was an institution known only as one of the traditions of the past greatness of Rome. See ROME.

COMITY OF NATIONS—more frequently mentioned by its Latin equivalent, *comitas gentium*— is that species of international legal courtesy by which the laws and institutions of one country are recognized and given effect to by those of another. "In the silence of any positive rule," says Mr. Justice Story, "affirming, or denying, or restraining the operation of foreign laws, courts of justice presume the tacit adoption of them by their own government, unless they are repugnant to its policy or prejudicial to its interests." From the existence of so great a number of independent states on the continent of Europe, and of federated states in America, the *comitas gentium* is more called into play in these countries than in England, and it has consequently been more extensively discussed by their legal writers. See Story's *Conflict of Laws*. See INTERNATIONAL LAW.

COMMA, in the mathematical study of sound, is applied to two small intervals, which, by comparison and calculation, arise as the difference between the proportions of certain other intervals of the diatonic scale. The larger, but seldomer occurring C. is called the *C. ditonicum*, or the Pythagorean C., being the difference between the true octave, whose ratio is 2 : 1, and the interval which arises when the octave is obtained by tuning a progression of twelve perfect fifths, or arithmetically by adding their values together; by which process it is found that the last sound is greater than the true octave in the proportion of 531,441 to 524,288. The smaller C., *C. syntonum*, or C. of Didymus, is—First, The difference between the large whole tone, the ratio of which is 9 : 8, and the small whole tone 9 : 10, which is found in the compound of these ratios produced by multiplying together respectively their antecedents, 9 and 9, and their consequents, 8 and 10, to be 81 : 80. Second, The difference between the great limma, 27 : 25, and the great half-tone, 15 : 16, which is found by the same process, and then reducing the resulting ratio to its least terms, to be also 81 : 80. Third, The difference between the diesis, 128 : 125, and the diaschisma, 2,048 : 2,025, which by the same process gives 81 : 80; and lastly, the difference between the *small* limma, 135 : 128, and the small half-tone, 24 : 25, which again gives the proportions 81 : 80. The difference between the *C. ditonicum* and the *C. syntonum* is exactly the *schisma;* therefore, the aggregate of the diaschisma and schisma, if they be added together, is neither more nor less than the syntonic comma. This C., again added to the diaschisma, makes up the diesis, and added to the great half-tone, makes up the great limma. It follows therefore that, practically, two enharmonic tones in perfect tune never differ by a syntonic C., and it is wrong to say that *d* flat is higher than *c* sharp by a C., while the real difference is that of a diesis, 128 : 125. In the equal-tempered scale, these varieties do not exist.

COMMA BACILLUS. The name given to the *spirillum*, or cholera germ, from its curved shape when viewed under the microscope. See CHOLERA.

COMMANDANT', in military matters, is the commander in charge of a garrison or fortified post. In foreign armies it designates a temporary commander.

COMMANDER in the United States navy is an officer next in position below a captain, and above a lieutenant-commander. In matters of etiquette he ranks with a lieutenant-colonel of the army. In his shoulder-straps are two silver leaves, and between them a silver foul anchor, the distinctive badge of his corps. He wears three one-half-inch stripes on his sleeve, with a five-pointed star above them. Distinctive corps marks are used for those staff officers having the relative rank of commander. A commander commands vessels of the third rate, and when afloat receives $3500, when on shore duty, $3000, and when on leave or waiting orders, $2800. There are 85 commanders on the active list of the navy.

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COMMANDER-IN-CHIEF is the highest staff appointment in the British army. It is held by the gen. commanding all the forces in India, and would probably be given to the leader of any *large* army in the field, whether abroad or at home. Formerly, the army at home was administered by an officer of this rank; but since the death of the duke of Wellington in 1852, the military administration has vested in an officer holding no higher commission than that of "general on the staff;" who is called the gen. (or field-marshal, according to the holder's army rank) commanding in chief. Since 1855, this officer has been strictly subordinate to the secretary of state for war. The office of the C., technically known as the "horse guards," is a department of the war office, and comprises the sub-departments of the military secretary, the adj.gen., and the quarter-master-gen., with a staff of clerks. Under the "war office act" of 1870, and by orders in council of that year, the officer commanding in chief is one of the three great officers who administer the military affairs of the country under the secretary of state for war; his department being that of military command, discipline, and promotion. In practice, he makes all promotions and military appointments; though, in theory, these are all made on the responsibility of the secretary of state. Appointments to very important positions on the staff would not be made without the supervision of the minister and probable concurrence of the cabinet. The officer commanding in chief is responsible for all recruiting operations, and for the appropriation of troops to particular localities; but he exercises rather a general inspectional control than any immediate command over the men. The actual command vests in the general officers commanding the districts into which the kingdom is parcelled.

A *naval* commander-in-chief is the chief admiral at any port or station.

By the terms of the constitution of the United States, the president is the commander-in-chief of all the land and naval power of the nation. The immediate commander of the land forces is the "general of the army." In most of the states, the governor is commander-in-chief of the militia.

COMMANDERY, the title of the meeting or meeting-place of freemasons who have reached the degree of knights templar. Its origin was with the knights of Malta of the middle ages, and was first applied to sums saved from the revenues of the order for the support of war against the Moslems. It soon came to mean persons and places rather than things, and the "grand commander" became the next office to the grand master. Among the religious establishments suppressed in England by Henry VIII. were more than 50 commanderies of knights templars.

COMMANDITE, SOCIÉTÉ EN, or PARTNERSHIP IN, an expression used for at least two centuries in France, to express a partnership in which one may advance capital without taking charge of the business, or may become a "sleeping partner," as it is called in this country. The term owes its origin to the old meaning in the commercial nomenclature of France of the word command, which was applied to one person authorizing another to transact business for him. The working partner had a *commande* from him who merely advanced capital. The term has acquired importance of late in political economy, because the law of France could exempt the sleeping partners from responsibility beyond the amount they might agree to be responsible for. On the other hand, by the law of the United Kingdom, down to the passing of the limited liability act, every partner of a company was liable for all its debts. Hence, in the discussions about the question, whether it would be prudent to relax this law, and permit persons to invest money in trading companies without undergoing this responsibility, such companies were called "partnerships in commandite."

COMMANDMENTS OF THE CHURCH are certain rules laid down by Roman Catholic ecclesiastical authority which have almost the force of scripture commandments. The chief of them require the observance of Sundays and holy days of obligation, attendance at mass, rest from servile work on certain days, abstinence from flesh and but one meal on fast days, confession of sins at least once a year, the reception of the sacrament once a year, contributions to the support of pastors, and certain regulations concerning affinity and times in marriage.

COMMEDIA DIVINA. See DANTE.

COMMELYNA'CEÆ, a natural order of endogenous plants, consisting of herbaceous plants, with flat, narrow leaves, usually sheathing at the base. The calyx is 3-partite; the petals three, sometimes cohering at the base. The stamens are six, inserted under the ovary, which is 3-celled; the style is single. The fruit is a capsule, with 2 to 3 cells and 2 to 3 valves, bursting through the middle of the valves. The seeds are often in pairs, inserted by their whole side on the inner angle of the cell; the embryo lies in a cavity of the albumen. The order contains more than 260 known species, natives chiefly of warm climates; but a few occur in North America. None are European. *Tradescantia Virginica*, or SPIDER-WORT, common in our flower-gardens, is a familiar example of the order. *Commelyna cœlestis* is a fine ornament of our flower-gardens. The treatment is somewhat like that of the dahlia.

COMMEMORA'TION, or ENCÆ'NIA, the great festival of the Oxford academic year, usually takes place on the third Wednesday after Trinity Sunday. It is of very ancient date, public exercises and recitations having been held from time immemorial in honor of the act, or period when masters of arts and doctors complete their degrees, at first in

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St. Mary's church, but, subsequently to the erection of the Sheldonian theater (1669), in that building.

At present, the proceedings consist of a Latin oration in honor of founders and benefactors, delivered in alternate years (according to the bequest of lord Crewe, bishop of Durham) by the public orator and the professor of poetry; the presentation of the honorary degree of D.C.L. to strangers eminent in science, politics, etc., who are introduced to the chancellor, or, in his absence, to the vice-chancellor, by the public orator, in a short Latin speech; and the recitation of the Newdigate or English prize poem, the Latin prize poem, and the Latin and English prize essays, the three last named prizes being the gift of the chancellor. During the ceremonial, the northern extremity of the theater is occupied by the vice-chancellor, doctors, proctors, etc.; the area or pit by masters of arts and their friends; the lower seats in the semicircle by lady visitors; and the upper, or gallery, by bachelors and undergraduates, who claim on this occasion all the time-honored privileges of a gallery audience. Commemoration day itself is only the culminating point of a week of gayety, in which concerts, balls, theatrical representations, etc., replace the usual studies of the university, and in which heads of houses and tutors are only tolerated in so far as they give a sort of official sanction to the general festivity. In the theater itself, the more strictly academic and solemn portion of the proceedings receives but scanty respect from the majority of the audience. A momentary pause may perhaps be made when the "Newdigate" is being recited, or when some "lion" of unusual mark advances to receive his degree; but as a rule, the noisy humors of the gallery command much more attention than the stately periods of the public orator, or the timid recitations of the prize essayists. Of late, however, a feeling has sprung up among the senior members of the university (shared in, it is said, by several distinguished strangers) that the license of the gallery has exceeded all due limits; and so a change has been made in the interior arrangements, the undergraduates not occupying a separate gallery, but being distributed among the ladies.

The vice-chancellor, who holds his office for four years, generally presides at C., but it is usual for the chancellor to do so once in the period of each vice-chancellorship. These occasions are called grand commemorations.

COMMENCEMENT, the name given in American colleges to the concluding exercises of the college year when degrees are conferred upon the graduating class. It corresponds, therefore, in a general way to "commemoration" at Oxford. The name "commencement" was given to the ceremony, because in the colonial period it took place at the beginning of the college year in the autumn, though now it is held in June or July. The exercises in most of our colleges consist of orations—including generally salutatory and valedictory addresses—from members of the graduating class who have won honors, announcement of prize awards, the conferring of degrees, and an address by the president of the college. A few colleges, as for instance, Yale and Columbia, have done away with the students' orations, and have reduced the ceremony to the conferring of degrees and the president's address.

COMMEN'DAM. When a priest is promoted to a bishopric, all his other preferments become void from the moment of consecration; but a method was devised by which the substantial interest in the living was retained by its being *commended* to the care of a bishop (called the commendatory) by the crown, till a proper pastor should be provided for it. Such a living was called an *ecclesia commendata*, and it was said to be held *in commendam*. The holding on this title might be really temporary for one, two, or three years, or it might be perpetual. By 6 and 7 Will. IV. c. 77, s. 18, it is provided that no ecclesiastical dignity, office, or benefice shall be held in C. by any bishop, unless he shall have held the same when the act passed.—Stephen, iii. 37.

COMMENDA'TORS, in Scotland, in Roman Catholic times, were stewards appointed to levy the fruits of a benefice during a vacancy.

COMMEN'SAL, a term denoting animals (not parasites) which attach themselves to other animals to share their prey. The term is equivalent to "table companion," and was applied to court-officers in France who had their meals at the king's table.

COMMEN'SURABLE. Two quantities or numbers are said to be commensurable which are of the same kind, and each of which contains a third quantity or number a certain number of times without remainder. See INCOMMENSURABLE MAGNITUDES.

COMMENTRY, a t. of France, in the dep. of Allier, 8 m. s.e. of Montluçon, on the Œuil. It stands in the center of one of the most important coal-fields of France, and since 1850 has risen from a mere village to be a busy and populous town. Pop. '91, 9316, mostly engaged in the coal-mines and iron-works. A railway connects it with Montluçon and other places, and with the canal de Berry. In 1846, an immense fire consumed an enormous quantity of the coal in the mines.

COMMERCE. The term C. in its general acceptation means international traffic in goods, or what constitutes the foreign trade of all countries as distinguished from domestic trade. The first foreign merchants of whom we read, carrying goods and bags of silver from one region to another, were the Arabs, the reputed descendants of Ishmael and Esau. Their trade was by land. The first maritime carriers of goods were the Phenicians, who dwelt in a narrow strip of land on the e. shore of the Mediterra-

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nean. They founded Tyre and Sidon, of whose opulence there are abundant proofs both in sacred and profane history. Launching their oared barks on the waves, and steering close along the shore so as to be able to take shelter in the nearest harbor on the approach of a storm, they established an easier and securer passage between Egypt and Syria than had before been known. The corn and wine of the Nile, and the oil, silk, dyes, and spices of western Asia, flowed through their hands. From carriers they became merchants, and to merchandise they added manufactures. In the days of Solomon their vessels penetrated the Red sea, and brought to that king the wealth of Ophir. They traversed the shores of the Mediterranean, established colonies in the Greek islands, and founded Carthage, one of the most noted commercial cities of the ancient world. The Phenicians flourished greatly until the capture of Tyre by Alexander, 332 B.C. Then the inhabitants who survived a long siege were killed or sold into slavery, and the very name Phenician disappears from history, absorbed, doubtless, in the rising glory of the cities of Greece—Athens, Corinth, Argo, and their colonies; of Carthage, then in full fame; and of Alexandria, the great seaport founded by the conqueror.

While Rome was giving laws and order to the half-civilized tribes of Italy, Carthage, operating on a different base and by other methods, was opening trade with less accessible parts of Europe. The strength of Rome was in her legions, but that of Carthage in her ships; and her ships could reach realms where legions were powerless. Her mariners had passed the mysterious strait into the Atlantic and established the port of Cadiz. They founded Carthagena and Barcelona, and had depots and traders on the shores of Gaul. This prosperity of their C. led to wars with martial Rome, and, 146 B.C., the great city of Carthage, more than 20 m. in circumference, and containing a million of inhabitants, was utterly destroyed. In the same year the Romans captured and burnt Corinth, which was then an important commercial city; and 60 years later, Athens met a similar fate. These disasters almost annihilated sea commerce. Land C. also suffered a disastrous blow soon after the fall of Athens, in the capture by the Romans of the important city of Palmyra, when the walls were razed, the people killed or dispersed, and the famous queen Zenobia taken to Rome a prisoner.

The repeated invasions of Italy by the Goths and Huns gave rise to the founding, for defense and for trade, of the city of Venice, about the middle of the 5th c.; a city that for more than a thousand years stood foremost in the trade of the world. The Venetians traded with Constantinople, Greece, Syria, Egypt, India, and Arabia. They became rulers in the Morea, in Candia, and in Cyprus. It was in Venice that the first public bank was organized; that bills of exchange were first negotiated, and funded debt became transferable; that finance became a science, and book-keeping an art. We cannot trace the steps of C. during the middle ages; nor is it important; in fact, international trade to any considerable extent was unknown. But the 15th c. showed a wonderful expansion of discovery, and consequently of trade. The mariner's compass made distant voyages possible on the open sea. In 1418, the Canary islands were colonized by the Portuguese; in 1431, the Azores were discovered; in 1486, the Guinea coast of Africa was made known; and in 1497, Vasco da Gama passed round the cape of Good Hope to Zanzibar. Before the end of the century, Columbus had thrice crossed the Atlantic, touched at San Salvador, discovered Jamaica, Porto Rico, and the isthmus of Darien, and had seen the waters of the Orinoco in South America. Meanwhile, Cabot, sent out by England, had discovered Newfoundland, Labrador, Nova Scotia, and Virginia. Nearly all this daring enterprise had for its prime object the finding of some easy route to the fabulously wealthy east, to India and China. But a century elapsed before the English fixed their first establishment or factory in India. The discovery of the new world, however, while so diligently searching for a sea route to the old one, was destined to change the course and the nature of trade. The Spaniards overran South and Central America, eager above all things for conquest and for gold; the French opened Canada and the great Mississippi; in 1621, the Dutch were fairly established in what is now the foremost commercial city of the two continents, and second to but one in the world in trade and importance—New York. About the same time the English colonized Virginia and New England.

From such rapidly spreading exploration and colonization there necessarily arose new wants, new products, new manufactures, and rapidly increasing trade; interrupted more or less by wars, but in the main marching steadily and rapidly on. The present century has witnessed an extension of the commercial relations of mankind to which there is no parallel in history. In 1819, the first steam-vessel crossed the Atlantic ocean, from Savannah, Ga., to Liverpool, and a similar adventure from England to India was accomplished in 1825. The application of steam to transportation and manufacturing immensely enlarged the capacity and needs of commerce. Another astonishing impulse to trade came with the discovery of gold in California and Australia. The two events were almost coincident, and came when a general extension of trade had already been ten years in progress. The first effect was to produce a great emigration to the regions in which the gold-fields were situated, and this was followed by large exports of goods to the same quarters, which, as usually happens when business falls out of the ordinary mercantile course, was much overdone, and ended in heavy loss to many shippers. Abundance of labor had been supplied with unwonted celerity to the gold-fields, and as the labor was not unremunerative, and in many cases was rewarded by large findings of gold, the commotion in emigration, shipping, and traffic was sustained for a

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number of years. The coffers of the great banks were filled with new supplies of gold, and this imparted confidence to banking operations by which the money was soon distributed. All this was calculated to give additional impulse and extension to the commercial forces already in motion; there was an increased demand for goods; much labor had been transferred from old seats of industry to new fields, and there was rise of wages as well as of prices. The California and Australia mines remain productive, though in a reduced degree, and their most permanent effect on C. will be found in the fact that they helped to build California into a populous and prosperous state, and to make the Australian colonies a growing empire.

Great as has been the effect of these gold discoveries upon C., they sink into comparative insignificance before an influence already alluded to, and that is steam. There is little use to descant upon steamships and railways, and the later important agency of the telegraph, all equally marvelous in their power of facilitating C., and in the rapidity of their construction to this end. In 1839, the ocean steamers of the world might have been counted on the fingers of one hand. To-day, all the great maritime states have lines and fleets of sea-going steamers, enormous for bulk and power, threading the great rivers, cleaving every sea, and gulf, and strait, and going and coming from every considerable port on the earth. Great Britain alone in 1895 had 3661 steam vessels employed wholly in foreign trade. No one knew until 1825 that goods and persons could be hauled over the land by steam, but after the lapse of seventy years there were over 180,000 miles of railroad in operation in the United States alone. The rapid development of the telegraph is more wonderful in an age of wonders than that of steam. It was in May, 1844, that the first line of magnetic telegraph (Morse's) was used in this country, between Washington and Baltimore, about 40 miles. In the next half century about 800,000 miles of telegraph wire were in use in the United States. Continents and nations are linked by submarine cables, and it is actually easier to-day for a merchant to send an order to and receive an answer from Calcutta than it was in 1840 to achieve the same feat between New York and Brooklyn. Still another modern improvement — made possible by the telegraph — has a beneficial effect upon C.; and that is the weather service established in the United States, Great Britain, and some other European countries. There can be no doubt that C. by sea has been rendered much more secure by the knowledge of the state of the weather at a distance, and the probabilities of what it is likely to be in any given place, now published in all centres of trade.

By these inventions and in the natural course of progress, C. has acquired a security and extension in all its essential conditions, of which it was void in any previous age. It can never again exhibit the wandering course from route to route, and from one solitary centre to another, which is so characteristic of its ancient history, because it is established in every quarter of the globe, and all the seas and ways are open to it on terms fair and equal to every nation. Wherever there are population, industry, resource, art, and skill, there will be international trade. C. will have many centres, and one may relatively rise or fall; but such decay and ruin as have smitten many once proud seats of wealth into dust, cannot again occur without such catastrophes of war, violence, and disorder as the growing civilization and reason of mankind, and the power of law, right, and common interest forbid us to anticipate.

COMMERCIAL CRISES. See PANICS.

COMMERCIAL LAW. See MERCANTILE LAW.

COMMERCIAL REGISTERS. The mercantile agencies of the United States have at command a mass of minute information, statistical and financial, the result of inquiries by their agents, weekly and other statements of trade journals, and lists published by special trades throughout the continent. The system is of comparatively late growth, the Bradstreet having been established in 1849, resulting from information originally accumulated by Mr. Bradstreet while settling up large estates in Cincinnati. This and Dun's are probably the largest, and their communications are always considered confidential to their subscribers. The aim is to indicate, by a system of marks, the standing of all business houses of any importance, in relation to amount of capital and commercial reputation.

COMMERCIAL TRAVELERS are the accredited representatives which large business houses send throughout the country to introduce their goods to smaller houses in the same line of trade. In this way many sections of the country are supplied with the newest goods and are made familiar with foreign products that would not otherwise reach them. This method of representation is comparatively new, having been introduced within the last fifty years, the "commercial traveller," "bagman," "rider," "drummer," being the successor to the "chapman" or pedler, who formerly carried with him his whole stock-in-trade, not his samples merely, as at present. In this way much has been done to equalize the distribution of products and also to maintain a corresponding equality in prices. This habit of going from place to place, necessarily imposed, is productive of a reckless manner of living, and in England, particularly, the death-rate has been disproportionately large, owing, in a great measure, to diseases caused by intemperance; and the great number of suicides among them is a noticeable fact. Happily, of late years, a marked improvement is observable. Statistics show that the number of commercial travellers has enormously increased within the last thirty or

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forty years. And yet there is room for more, especially for men who thoroughly understand the different kinds of trade, as with the improvements in machinery, electricity, the factory system, banking, etc., the commercial traveller has risen in importance, and a still further development is possible. The remuneration varies: sometimes it is paid entirely by commissions, sometimes by salary and commissions, and oftentimes by a stated salary and all expenses paid. Many societies have been formed for the benefit of these workers both in Europe and the United States. There are the Commercial Travelers' Benevolent Institution, of England, the Commercial Travelers' Society, of Scotland, and the United Kingdom Commercial Travelers' Association, which has done much good work in pushing forward hotel and railway reforms. A newspaper, *On the Road*, was established in England in 1883. In the United States there are the Commercial Travelers' Association of New York, the North Western Traveling Men's Association of Chicago, one at St. Louis, a secret society, organized in 1888, called an Order of Commercial Travelers, a Travelers' Protective Association, which is arranged for provision against overcharges by hotels, railroads, etc., and the Commercial Travelers' Home Association, organized in 1892, for the building of a Commercial Travelers' Home at Binghamton, N. Y. Work on the construction of the Home was begun July 16, 1894. The Association publishes the *Home Magazine*. There are some few women, who may be found representing certain firms in particular lines, but the percentage of them is small. Their organ, *The Merchant Traveler*, is published in Chicago.

COMMERS, among German students, indicates a social meeting, where non-compliance with rules enforces a fine which assists in defraying expenses. The beer-glasses are circulated upon a small railroad, and any one failing to seize his own, as it passes, or neglecting to raise, or shake, or recover his glass at a signal from the chairman is fined.

COMMINA'TION is from the Lat. *comminor*, to threaten, and is the name given to a penitential service used in the primitive church. In the earliest ages, those who were guilty of grievous and notorious sins were put out of the church, until, on their repentance, and after long trial, they were restored to full communion. It seems that, at least from the beginning of the 8th c., there was an office of this kind for public penitents on the first day of Lent; but from various causes the penitential discipline became extinct, both in the eastern and western churches, and the office for Ash Wednesday (so called from the penitents coming clad in sackcloth and ashes) is the only memorial of it left. The office, as used in the church of England, is nearly the same as those found in the Salisbury and York missals. The curses contained in Deut. xxvii. against impenitent sinners are read, and the congregation answer "Amen" to every sentence, as acknowledging the justice of the sentences. See Bingham's *Antiquities*.

COMMISSA'RIAT is a name for the organized system whereby armies are provided with food, and daily necessaries other than those connected with actual warfare. Among the ancients the Romans attended best to the C.; the *quæstors* were the commissaries. In feudal times, the soldiers were mainly dependent for food on their lords; but they lived very much by plunder. During the wars of the crusades, the C. was so utterly neglected, that thousands died of starvation.

In the U. S. army the C. is in charge of the "commissary of subsistence," an officer with the rank of brig.gen.

COM'MISSARY, in general, is any one to whom the power and authority of another is committed. In this sense it is nearly equivalent to commissioner.

COMMISSION, a writing, in the form of a warrant or letter-patent (see PATENT), authorizing one or more persons to perform duties or exercise powers belonging to another, or to others. Instruments of delegation, bearing this title, are issued by the crown to officers in the army and navy, judges, justices of the peace, and others.

Another class of commissions are those granted sometimes by the crown, and sometimes by parliament, to a body of persons, either to inquire into the condition of certain institutions or branches of the public service, or to exercise certain powers, or execute certain measures for their improvement. Persons holding such commissions, deriving no other title from their appointment, are called commissioners.

COMMISSION, HIGH JOINT; or GENEVA COMMISSION. See GENEVA ARBITRATION.

COMMISSIONAIRES are a class of attendants at continental hotels, who perform certain miscellaneous services. Employed to attend at the arrival of railway-trains and steamboats to secure customers, they wait to take charge of luggage, see it passed through the hands of the custom-house officers, and send it on to the hotel; for all which service they charge a fee. They likewise procure visés to passports, and act as valet-de-place. In this last capacity, they may be hired for the day to conduct strangers to public places of interest, galleries of art, or other sights. In Paris, they are generally respectable and intelligent, and speak English with tolerable fluency. In the French outports, such as Boulogne, they can be referred to less favorably.—Lately, a body of C. has been established in London, and also in Edinburgh, consisting of maimed soldiers who have retired with a pension, and are of unexceptionable character. On a moderate tariff of charges, they act as messengers, light-porters, valet-de-place, and make themselves otherwise useful.

COMMISSION OF ASSEMBLY. See ASSEMBLY, GENERAL.

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COMMISSION DEL CRE'DERE. A premium, over and above the usual rate of commission, paid by a principal to his factor in consideration of the latter's guaranteeing the solvency of purchasers. See FACTOR.

COMMISSION MERCHANT, or AGENT, called also a broker, or factor, is a persor employed to sell goods consigned or delivered to him by another who is called his principal, for a certain percentage, commonly called his commission or factorage. As the goods thus received are said to be consigned, the C. M. or agent is often called a consignee.

COMMISSIONS, ARMY, are warrants for serving the crown in certain military offices. Those holding such authority are called *commissioned officers*. Non-commissioned officers form a step intermediate between commissioned officers and private soldiers. First commissions in the probationary rank of sub-lieut. are granted by competitive examination open to every British subject of proper age and character. Subsequent—i.e., higher—commissions are given up to the rank of lieut.col., by "selection tempered by seniority." The commission of col. is attained by service only, and commissions as maj.gen., lieut.gen., and gen., follow by pure seniority. These remarks apply to cavalry and infantry only: commissions in the artillery and engineers are obtained—first, by passing a severe course of study at Woolwich academy, admission to which is by open competition; later commissions by seniority entirely. Before Nov. 1, 1871, commissions in the cavalry and infantry were partly obtained by purchase, under the system, now abolished, called the PURCHASE-SYSTEM. The prices of commissions rose gradually from the time of Charles II. until the Russian war of 1853, when the *regulation prices* were as follows:

Rank.	Regulation Price of Commissions.	Diff. in value betweer the several Com. in succession.
LIFE GUARDS.		
Lieutenant-colonel	£7250	
Major	5350	£1900
Captain	3500	1850
Lieutenant	1785	1715
Cornet	1260	525
DRAGOON GUARDS AND DRAGOONS.		
Lieutenant-colonel	£6175	
Major	4575	£1600
Captain	3225	1350
Lieutenant	1190	2035
Cornet	840	350
(The prices of cavalry commissions were reduced in 1861 to infantry rates.)		
FOOT GUARDS.		
Lieutenant-colonel	£9000	
Major, with rank of Colonel	8300	£700
Captain, " Lieutenant-colonel	4800	3500
Lieutenant, " Captain	2050	2750
Ensign, " Lieutenant	1200	850
(In 1857, purchase was limited to the lower three ranks.)		
LINE REGIMENTS.		
Lieutenant-colonel	£4500	
Major	3200	£1300
Captain	1800	1400
Lieutenant	700	1100
Ensign	450	250

The conditions of promotion, and the operation of the purchase-system, will be considered under PROMOTION and PURCHASE-SYSTEM. In the navy also, the chief officers hold their authority by commission. See OFFICERS; PROMOTION.

COMMITMENT. See IMPRISONMENT.

COMMITTEE, one or more persons (rarely less than three) to whom an organized body legislative or otherwise, intrusts or *commits* certain matters for investigation, consideration, and recommendation of action on the part of the whole body. A *standing committee* is one which exercises its functions permanently and considers all matters coming within a certain allotted sphere of action or relating to certain general topics. In modern parliamentary practice immense importance attaches to the work of standing committees, and so true is this that modern legislation has been by some slightingly termed government by committees. Almost every matter brought before such bodies as the English Parliament, the United States Congress and the legislatures of the several states is, at once, referred to a standing committee, which holds meetings by itself, examines the subject closely, summons witnesses, if necessary, and at length reports back to the main body their findings and conclusions, with recommendation to act favorably

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or adversely; the committee usually formulates its conclusions, in a bill recommended to be passed, if action is thought desirable. The United States House of Representatives has at least fifty committees; the Senate about forty; these consist of not less than three and, except in one or two cases, not more than fifteen members. The most important committees of the House are, that of Ways and Means—which considers all matters relating to the tariff, to internal taxation, and, generally, to the revenues of the Government—and that of Appropriations, which deals with all estimates of appropriations to be made by Congress and the framing of bills for that purpose. Similar committees exist in the English parliament. The overwhelming argument in favor of this system of committees is the impossibility of a large deliberative body examining every matter within the scope of its action in detail; the objection to it is the possibility of more easily corrupting or deceiving a small body than a large one; in all, as a matter of convenience, facility of action and practical working, the committee system is fully recognized as a necessity and is too firmly intrenched in parliamentary practices to be successfully argued against. A *select committee* is one appointed at a special time to consider and report on a given topic; when this has been done its powers and existence cease. The *committee of the whole* is the entire body sitting in a deliberative rather than a legislative character—for the purpose of debating and consulting upon the details of a question rather than of taking upon it legislative action. In the English parliament the strict phrase for such a session is the Committee of the Whole House; in the United States House of Representatives the technical phrase is the Committee of the Whole House Upon the State of the Union. In the English House of Commons there is a regularly chosen chairman, other than the Speaker of the House, who presides over all committees of the whole; in the United States Congress any member may be chosen to preside in a committee of the whole. A *joint committee* is one made up of separate committees appointed by two bodies; in the United States in Congressional or State legislative action, owing to the dual constitution of our legislatures, it is often necessary to appoint such joint committees to bring the two bodies to a mutual understanding and make action possible. In law the phrases *committee of the person, committee of the estate, committee of the person and the estate* are applied to one or more persons to whom a court intrusts the care, respectively of the person, the property, or the person and property of one who is insane, an inebriate, or a minor, and whose interests are in litigation before that court.

COMMODORE, an officer of the navy ranking next after a rear-admiral, and next above a captain. Although the grade was first recognized by law in 1862, it had long been a distinctively American title for an officer in command of several vessels. In the English navy it is not a permanent title, but is bestowed for the time on the senior captain of a small squadron when there is no flag-officer present. He ranks with a brigadier-general in the army. In his shoulder-strap is a silver star and two foul anchors, and on his sleeve a broad gold band. He may command a division or a squadron, or be chief of staff of a naval force commanded by an admiral, a vice-admiral or a rear-admiral; or he may command ships of the first class or naval stations. He can also be chief of a bureau of the navy department, member of a board, superintendent of the naval academy, naval asylum, or naval observatory. When appointed to command a squadron, he is for the time being an acting rear-admiral, and is entitled to wear the uniform and receive the honors due to an officer of that rank. His pay when at sea is $5000, when on shore duty, $4000, and when on leave or waiting orders, $3000. There are ten officers of the grade of commodore allowed by law.

COM'MODUS, Lucius Aurelius, a Roman emperor, b. 161 A.D., was the son of Marcus Aurelius Antoninus. Great pains were taken with his education. But the solicitude of his father was all to no purpose. C. only waited for an opportunity to exhibit as startling and detestable a mixture of sensuality, cruelty, and meanness as had ever been witnessed in Rome. When he was summoned to the throne on his father's decease, 17th Mar., 180, he manifested a shameful eagerness to plunge into the dissipations of Rome. At that period he was successfully fighting the Marcomanni and other tribes on the upper Danube, and, not to be balked of his anticipated pleasures, he hastily concluded a treaty with the barbarians, and reached the capital in the beginning of the autumn. The cruelty to which he was always prone, was especially called into action after a conspiracy by his sister Lucilla against his life had been discovered in the year 183. Nearly all who, by virtue, ability, and learning, had risen to honor during his father's lifetime, were sacrificed to appease his savage jealousy of the good and the great. Gross prodigality in the expenditure of the resources of the state on the amusements of the amphitheater also marked his reign. He was proud of his own physical strength, and exhibited it in gladiatorial combats. For each of these exhibitions, he charged the state an enormous sum. He used also to sing, dance, play, act the buffoon, the peddler, or the horse-dealer, and engage in all the filthy and horrible orgies of Egyptian sacrifice. A glutton, a debauchee, who wallowed in the most sensual abominations, he yet demanded to be worshiped as a god, and assumed the title of Hercules Romanus. Many plots were devised against the life of this mingled monster and madman, and at last one of them accomplished its purpose. His mistress, Marcia, in concert with the prefect Laetus and the imperial chamberlain Eclectus, after they had failed in an attempt to poison him, caused him to be strangled by Narcissus, a famous athlete, on the 31st of Dec., 192.

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COMMON, in the law of real property the right of one person to use or profit by land belonging to another, or to the State. Such a right may be *common of pasture*—the right to feed stock—and much most the usual form of the right; common of *piscary*, the right of fishing; common of *estovers*, the right to take wood; *common in the soil*, the right of mining; and several others. The phrase is often used to denote the common use of a piece of unenclosed ground possessed by all the inhabitants of a village or hamlet. The right of common is disturbed, as the legal phrase is, when one who is not possessed of the right unlawfully infringes it, or when one possessed of the right exceeds his lawful use, or where one wrongfully prevents others possessed of the common right from exercising it, as where he encloses the land. In Great Britain the right of common was formerly possessed from time immemorial in almost every village with regard to certain pieces of land not held by any owner in fee, and which might be fairly considered to belong to the community as a body. Statutes, both public and private, permitted the enclosing of such common land under various conditions, such as the consent of two-thirds of those exercising the right of common; by this legislation, and by acts of usurpation on the part of individuals, much of the common land has been lost; of late years the further enclosure of common land has been to some extent guarded against. In the United States the most frequent use of the term is as a substantive to denote a piece of ground set apart for public uses, such as open air meetings, reviews, and for the general pleasure of the people at large.

COMMONAGE. See COMMON.

COMMON, TENANCY IN. This is an estate (q.v.) or a right in property accruing to two or more persons; and the nature of it is, that each has a distinct right to his own share, although no division has yet been made. But the common owners may agree to a partition, or one of them may, in equity, compel a partition. If the estate is one which passes by inheritance, the heir of each owner takes his share, and there is no benefit of survivorship. A tenancy in C. may be created either by a conveyance in express words, or by the parties obtaining their titles at different times, or at the same time from different parties. But if the title accrues by descent from the same ancestor, even though at different times, it is a tenancy in coparcenary (q.v.).

COMMON BENCH. See BENCH and COMMON LAW, COURTS OF.

COMMON CHORD. See CHORD.

COMMON COUNCIL, ordinarily means, in American cities, the local legislative body, consisting of the boards of aldermen and assistant aldermen, or councilmen, or selectmen. In Boston, and a few other cities, the aldermen form a different board from the common council.

COMMON COUNTS. Short formal statements of the cause of action made in a declaration (q.v.).

COMMON DEBTOR. See DEBTOR and CREDITOR.

COMMONER, in England applied to all citizens except the hereditary nobility. John Hampden was called the "great commoner," and the title was also given to the elder Pitt before he became a member of parliament. In Oxford, students of the second rank who pay board are called commoners.

COMMON FORMS are the ordinary clauses used in writs and deeds in England. It has been attempted to substitute, for some of these, short expressions conveying all the meaning of the C. F.; but the statutes by which the attempt was made (8 and 9 Vict. c. 119 and c. 124), being permissive merely, have as yet not affected practice. A main reason for the preservation of C. F. was the general rule that conveyances were paid not according to value, or the difficulty of their task, but according to the length of a deed. A statute of the session (23 and 24 Vict. c. 145) made a further effort to abolish the C. F. used in appointing trustees, etc., by giving to them the powers which were formerly contained in the common forms. Brevity, however, gains ground.

COMMON GOOD. See CORPORATION.

COMMON HOUSE, or COMMON ROOM, was an apartment in a monastery in which a fire was constantly kept burning for the use of the monks, who frequently were allowed no fire anywhere else. The C. H. was presided over by a monk, who was called the master. It was the prototype of the common rooms in the colleges and halls of the English universities.

COMMON LAW, the great body of English unwritten law (from which also is, in the main, derived the common law of the English colonies and of the United States), as distinguished from written or statutory law, from the Roman civil law, from international law, and from the systems of law administered by courts of equity and admiralty courts. Blackstone divides the civil law of England into the *lex scripta*, or statute law and *lex non scripta*, or common law, and defines the latter as consisting of general customs, of particular customs prevailing in certain districts, and of certain laws used in particular courts. Common law is based primarily on customs growing out of the united wisdom and experience of mankind; these customs in time become recognized as reasonable, consistent, and established, are sanctioned by the courts, and are interpreted and made binding by the decisions of the final courts of appeal. While Continental countries generally follow the carefully classified and codified system of the Roman

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civil law, the common law of England was a growth gradual and in its origin complex —derived from the customs and precedents of Anglo-Saxons, of Normans, of the united England which followed the Norman rule, and including also some principles and practices derived through one of these sources from the Roman law itself. It must be remembered that even at the time of the Norman Conquest, England had a definitely established, though, of course, crude legal system, and on that system much of the common law, though perhaps not the greater part, rests. From its nature the common law cannot be sought in any one book or digest; its principles are discussed in the treatises of innumerable writers of text-books and commentaries and in the records of the decisions of the courts: commentators cannot make law, but they may discuss and record it; the real oracle of the common law is the judge, who considers and weighs precedents, measures them by the standard of reason and public policy, and sets finally the seal of authority upon them by his decision. Great importance, therefore, is attached to precedent in ascertaining the principles of the common law; it was, it is conceded, because too much importance was attached to precedent that side by side with the system of common law grew up to correct and supplement it a system of equity law. See EQUITY. On the other hand the greatest jurists of the English bench have most widely recognized the fact that precedent must be tempered by reason. Lord Mansfield, more than any other one judge, enlarged in this way the interpretation and application of common law principles, and was accused, indeed, of assuming legislative rather than judicial powers. But there can be no question that his view, carried out with unswerving devotion to natural justice, to the necessities of growing and changing mercantile and legal conditions, and to the true fundamental principle of precedents, did much to make the administration of law in England pliable and efficient. We may illustrate the manner in which common custom became common law by citing the recognition by courts of the already long-established principle of primogeniture; of the similar recognition of the fact that the validity of a deed depends on its being sealed and delivered; of the recognition of the principle that wills should be less strictly construed than deeds; of the sanctioning the already existing mercantile custom that three days of grace should be given in the payment of notes and bills. In all these cases the law did not make the custom or principle, but found it ready made to hand, recognized its convenience and usefulness and sanctioned it by judicial authority. Though based so firmly on custom and precedents, the common law is not totally inelastic. The continual growth of modern civilization, the progress of invention and manufactures, and the increased complexity of business—all have demanded from the common law recognition and an adaptation of the law to the conditions of the time. The rule generally followed as to precedents is that the courts will always "abide by former precedents where the same points come again in litigation." But the decision of one of two courts of concurrent jurisdiction does not necessarily bind the other, nor will a new decision by a court of appeal always be supported by that very court in subsequent cases. It follows, therefore, that often precedents almost equal in number and authority may be quoted on both sides of a given question, and in such a case the power and authority of the court appealed to are called upon to decide, as is consonant with justice and reason. In the United States, as each state has a final court of appeal, and as theoretically they are of equal authority, such a contradiction of precedents and decisions is frequent. The United States considered as one body politic has no common law; federal courts, when acting as common law courts, follow the common law as it stands in the particular state where the action arises. As for the states themselves, the common law of England, as it existed at the time of the Revolution, together with such of its statutes as reasonably applied to the colonies, became at that time the common law of the states. In this country, as in England, of course, the body of the common law has developed with growing industrial conditions, and has on the other hand been from time to time restricted by statutes of the states or of the United States. What we have said in regard to the common law of the states has one exception, Louisiana, which when ceded to this country retained in the main the system of Roman civil law already existing. The common law on a given point is always set aside by a statute covering that point; thus in the United States the order of authority of law is: the federal constitution; the treatises and acts of Congress; the constitution of the State; the statutes of the State; and finally the common law. When a statute is rescinded the common law on that point again becomes of force unless there be an older statute, in which case that revives.

COURTS OF COMMON LAW are classified as superior or inferior courts, and are both of original and appellate jurisdiction. The three divisions of the English superior law courts are known as the Court of Queen's Bench, Court of Common Pleas, and the Court of Exchequer. All three are historically descended from the *aula regia* (or *aula regis*), literally King's Hall or Court. This was the name of the court established by William the Conqueror for purposes of counsel as well as of determining disputes between subjects; it took, to some extent, the place of the Anglo-Saxon *wittenagemot*, which was a court of appeal as well as a general assembly. The *aula regis* always accompanied the person of the king; hence the court had no fixed place of hearing. To obviate this inconvenience the Magna Charta established Westminster Hall as the place of holding the court, and in the reign of Edward I. the original court was divided into or superseded by the three superior courts before mentioned, and the court of chancery or equity

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court. The court of common pleas is considered as most directly the descendant of the original *aula regis*. By the Judicature Act of 1878, which went into operation two years later, these three courts were made three out of five divisions composing the High Court of Justice, and are now called respectively the Queen's Bench Division, the Common Pleas Division, and the Exchequer Division of that court. They are not now exclusively common law courts, though they retain in the main their former distinctions as regards the class of cases of which each takes cognizance. Generally speaking, these superior courts have jurisdiction throughout England over all common law rights. Of the inferior courts the most important in England are the county courts; before the Judicature Acts there were a great number of inferior courts (some of very ancient origin) of very limited jurisdiction, and many of which have now become obsolete. In the United States, as a rule, courts of common law are not distinguished in form from courts of equity, though a few States have courts whose jurisdiction is exclusively of a chancery or equity kind. The federal courts are given by the constitution both common law and equity jurisdiction. Each State has its own system of common law courts and these systems are by no means uniform. Each includes a Supreme Court or Court of Appeal, which usually has also some original jurisdiction; inferior or original courts known as courts of common pleas, county courts, or superior courts, and courts of lesser authority and more restricted power, such as city courts, districts courts, probate courts, or justices' courts. The system of each state is established by its own statutory enactment or by the provisions of its constitution.

COMMONPLACE BOOK. A sort of scrap-book for jotting down memoranda, occasional thoughts, or ideas for subsequent development. Southey and Dickens both kept commonplace books of which they made much use.

COMMON PLEAS. See COMMON LAW, COURTS OF.

COMMON PRAYER-BOOK. This contains the forms of public worship and administration of the sacraments and other rites and ceremonies according to the use of the Episcopal Church in England and America. It is, for the most part, a translation of such portions of the services of the ancient Catholic church as were considered by the reformers free from all objection. Before the reformation, the liturgy was in Latin, and the form generally adopted in the s. of England was that after the use of Sarum. The first steps towards its reformation were taken by Henry VIII., the main objects in view being the abolition of what was superstitious, and the translation of the services into the vulgar tongue. In the year 1540, a committee of bishops and divines was appointed for the purpose, and what was done by them was revised by convocation in 1543. In the year 1545, the *King's Primer* came forth, containing, amongst other things, the Lord's prayer, creed, ten commandments, "Venite," "Te Deum," litany, and other hymns and collects in English, several of which were in the same version as at present used. It was, however, in the reign of Edward VI. that the most important steps were taken for framing a new service-book. In opposition to the practice introduced by the Roman Catholic church, an act of parliament was passed, ordering the communion to be administered to the laity in both kinds, and a formulary was drawn up for this purpose, and used at the end of the Latin mass. In the following year, a complete service-book was drawn up, including offices not only for Sundays and holidays, but for the administering of baptism and confirmation, for matrimony, the burial of the dead, and other occasions, together with the above-mentioned office for the communion considerably altered. This book was compiled by Cranmer and Ridley, assisted by eleven other divines; it was revised by convocation, and confirmed by king and parliament, and published in 1549, and is known as the FIRST PRAYER-BOOK of Edward VI. It differed from the one now in use by beginning the daily service with the Lord's prayer, by retaining prayers for the dead, and directing the use of the sign of the cross in confirmation and visitation services, and the anointing of the sick. It was drawn up with great prudence, retaining as much, and altering as little as possible of what had been familiar to the people. In 1550, the ordination service was added, taken principally from that used by the Roman Catholic church, but omitting certain ceremonies, and adding most of the questions proposed to the candidates. This service differed but little from that now in use, as authorized in 1662.

In 1551, objections, as might be expected, were made from various quarters to this *first* prayer-book, and Cranmer proposed to revise it, and called to his assistance two distinguished foreign reformers—Martin Bucer, and Peter Martyr. In this revision, some of the principal alterations were the addition of the opening sentences, the exhortation, confession, and absolution at the beginning of the service, the disuse of oil in baptism, of unction of the sick, and of prayers for the dead. The book thus altered was confirmed by act of parliament in 1552, and is called the SECOND PRAYER-BOOK of Edward VI.

In the reign of queen Mary, the acts of 1549 and 1552 were repealed, and therefore, at the accession of Elizabeth, it was necessary to reverse this repeal; and this afforded a fresh opportunity of revising the whole. The question then arose (1560) as to which of king Edward's two books should be adopted. The queen herself would probably have preferred the first, as containing many of the old ceremonies to which she was attached, but the second was chosen, and a few unimportant changes introduced. This

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may be called the THIRD COMMON PRAYER-BOOK. No alteration was made by it as to the use of church ornaments and vestments, which were directed by the act of uniformity, 1559, to be retained as they were left by the authority of parliament in the second year of Edward VI.

On the accession of James I., after the Hampton court conference, the book was again revised; and a few judicious changes made, e.g., some forms of thanksgiving were added for special occasions, and the explanation of the sacraments by Dr. Overall after the catechism; midwives and laymen were also prohibited from baptizing. In this state, the C. P. was left until the restoration, when, at the request of the Presbyterians, the king consented to a fresh revision, 1661. Twelve bishops were appointed to confer with an equal number of Presbyterian divines, each side having nine coadjutors. They were to consider the principal objections raised against the liturgy as it then stood. This was called the Savoy conference. The Presbyterians brought forward all the objections that had been made by the Puritans for the last century, adding new ones of their own. Baxter went so far as to say that it was incapable of amendment, and was bold enough to offer an entirely new liturgy of his own composition to be received in the place of the authorized one. It is hardly necessary to add, that the conference broke up without anything being done, except that the bishops proposed a few alterations, which were adopted by convocation in 1662, and confirmed by act of parliament. Among these changes, the new authorized version of the Scriptures was adopted, except in the Psalms (which follow the version of Coverdale's Bible, and had become familiar to the people), and in the commandments and the sentences at the communion service; the general thanksgiving was added, and the form of prayer to be used at sea. It is proper to observe that the four forms of prayer known as the *state* services —viz., for Gunpowder treason, on Nov. 5; for king Charles's martyrdom, Jan. 30; for the restoration, May 29; and the king's accession; were never properly a part of the C. P., but were annexed to it by order of the king in council at the beginning of every reign. Upon an address of both houses of parliament, in conformity with the wish of the clergy, an order in council was given by queen Victoria for discontinuing the first three. There have been four acts of uniformity—viz., in 1548 and 1552, both of which were repealed by that of Elizabeth in 1559; and the last in the 14th year of Charles II., 1662, which left that of Elizabeth unrepealed. In the great rebellion, 1643, the Long parliament prohibited the use of the Common Prayer-book. At the revolution in 1668, no change was introduced into the prayer-book; for although a commission was appointed for the purpose, the second downfall of episcopacy in Scotland in 1689 caused such alarm in the English church that the matter was dropped.

Concerning the use of the English C. P. in Ireland, it is sufficient to say that, in 1551, the first prayer-book of Edward was introduced by the king's authority, after some opposition; and the same prayer-book continued to be used on both sides of the channel till the Irish branch of the united church was disestablished. In 1875, the general synod of the church of Ireland adopted a revision of the C. P., but without essential alteration. In Scotland, which had as yet no settled liturgy, Laud attempted to introduce the English prayer-book, but with alterations in the communion service which were likely to be very offensive to a people so hostile to the church of Rome. This attempt was followed by riots, and ultimately led to the abolition of the Scotch episcopate and to the solemn league and covenant. The English C. P. is now used in most of the Episcopal churches in Scotland, but in some a liturgy resembling that of Laud, but framed by the non-jurors more on the model of the eastern liturgies, is used in the communion service. In the United States, also, the English C. P. is used, with some slight changes. See LITURGY.

COMMONS, the dinner provided in English colleges and inns of court for their members. In the inns of court, it is provided only during term. Separate tables are appointed for the benchers (q.v.), for the barristers, and for the students and other members of the inn.

COMMONS, HOUSE OF. See PARLIAMENT.

COMMON SCHOOLS. The Puritan settlers of New England built the school-house by the side of the church even before they had provided permanent homes for themselves. Their first schools (in which Latin was taught) were, however, free in part only, and to those who had contributed to found them. The free public school was of New England origin. A Massachusetts law of 1643 required that every township containing 50 families should have a school for all the children; the tuition to be paid either by their parents or by general provision. In Hartford, Conn., in 1642, a school was instituted and funds for it provided from the public treasury; and in the following year a vote was passed that "the town shall pay for the schooling of the poor and for all deficiencies." New Hampshire and Vermont, in like manner, provided for schools in every hamlet that could furnish employment and support to a teacher. Even amidst the almost constant conflicts with the Indians and French in which the colonies were involved, C. S. were steadily maintained. In 1670, one fourth of the annual revenue of the colony of Connecticut was spent for the support of the common schools. In 1795, the state of Connecticut devoted the money obtained by the sale of her western reserve lands, amounting at the time to $1,200,000, to the support of her common schools. Mass-

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achusetts made a similar use of a part of her lands in Maine. Within the last 60 years the system of C. S. has been systematically extended throughout all the states and territories, and the course of instruction has been greatly enlarged. As each state has control of its own schools, there is great variety in the details of their management. The following leading principles are the same in all: 1. A system of graded schools embracing primary, grammar, and high schools. 2. State superintendents who determine by examinations the qualifications of the teachers and watch over the efficiency of the instruction given. 3. Uniformity of text-books. 4. Public examinations. 5. School libraries and illustrative apparatus. 6. Improved construction and furnishing of schoolhouses. 7. Access to the school for all children of suitable age. 8. Normal schools for the training of teachers. Some of the states have funds to aid them in supporting their schools. In the western states these funds are generally large, arising from the sale of lands granted by the general government, and, in some instances, also by the state. Such grants by the United States for school purposes amount to 68,000,000 of acres, valued at more than $60,000,000. In many of the states the attendance of children, within specified ages, and for at least a part of the year, is compelled by law. Before the civil war there was no general and well-ordered system of C. S. in the southern states. But in their new state constitutions they have made provision for them, and are now pressing forward the work. In 1867, a National Bureau of Education was established by congress for the purpose of collecting statistics and diffusing information on the whole subject, so as to aid the people of the United States in the adoption and support of the best school systems, and to advance in other ways the cause of education through the land. In the year 1895, as reported by it, the school population of the states and territories was 20,328,147; the public elementary schools had 14,201,752 pupils enrolled, 396,327 teachers, and expended $178,215,556. See EDUCATION.

COMMON SENSE, THE PHILOSOPHY OF. There are certain beliefs that have been current among men in all ages, which, when canvassed by one set of philosophers, have been declared to be groundless illusions. Of these, the most remarkable instance is the belief in an external, material world, independent of any mind to perceive it. The doctrine put forth by bishop Berkeley, as opposed to the common opinion, was, that "the whole universe subsists, and can only subsist, within such a sentient, invisible, and conscious thing as the mind is known to be. In this way, each human mind must have within it a separate universe of its own, but so exactly the same in all minds, that every object of sense, and every movement of every object that is to be found in the universe of one mind, is to be found also in the universe that is within the other mind; the general effect of all which conditions is much the same as that which would be produced if several people were all dreaming, exactly at the same time, exactly the same dream." "The result of Berkeley's inquiry," says Dr. Reid, "was a serious conviction that there is no such thing as a material world—nothing in nature but spirits and ideas; and that the belief of material substances, and of abstract ideas, are the chief causes of all our errors in philosophy, and of all infidelity and heresy in religion. His arguments are founded upon the principles which were formerly laid down by Des Cartes, Malebranche, and Locke, and which have been very generally received. And the opinion of the ablest judges seems to be, that they neither have been nor can be confuted; and that he hath proved, by unanswerable arguments, what no man in his senses can believe. Hume proceeds upon the same principles, but carries them to their full length; and as the bishop undid the whole material world, this author, upon the same grounds, undoes the world of spirits, and leaves nothing in nature but ideas and impressions, without any subject on which they may be impressed."—*Inquiry into the Human Mind*, c. 1, s. 5.

A dead-lock in philosophy was the result of those doctrines of Berkeley and Hume; and the solution offered by Reid consisted in setting up C. S. as an arbiter from which there could be no appeal; that is to say, the universally admitted impressions of mankind were to be taken as corresponding to the fact of things without any further scrutiny. Reid's philosophy of C. S. has thus found a place in the thinking-world; and it is only the same view otherwise expressed, when it is declared by other philosophers that the deliverance of consciousness must be presumed true. Sir W. Hamilton, in the most elaborate vindication of the C. S. philosophy that has ever been produced (edition of Reid's works), dwells largely upon this last view of the subject. The following extract is a specimen of his mode of reasoning: "When, for example, consciousness assures us that, in perception, we are immediately cognizant of an external and extended *non-ego* (not-self); or that, in remembrance, through the imagination, of which we are immediately cognizant, we obtain a mediate knowledge of a real past: how shall we repel the doubt—in the former case, that what is given as the extended reality itself is not merely a representation of matter by mind; in the latter, that what is given as a mediate knowledge of the past, is not a mere present phantasm, containing an illusive reference to a real past? We can do this only in one way. The legitimacy of such gratuitous doubt necessarily supposes that the deliverance of consciousness *is not to be presumed true.* If, therefore, it can be shown, on the one hand, that the deliverances of consciousness must philosophically be accepted *until* their certain or probable falsehood has been positively evinced; and if, on the other hand, it cannot be shown

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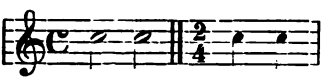
that any attempt to discredit the veracity of consciousness has ever yet succeeded; it follows that, as philosophy now stands, the testimony of consciousness must be viewed as high above suspicion, and its declarations entitled to demand prompt and unconditional assent."

"In the first place, it cannot but be acknowledged that the veracity of consciousness must at least, in the first instance, be conceded. Nature is not gratuitously to be assumed to work, not only in vain, but in counteraction of herself." "But in the second place, though the veracity of the primary convictions of consciousness must, in the outset, be admitted, it still remains competent to lead a proof that they are undeserving of credit. But how is this to be done? As the ultimate grounds of knowledge, these convictions cannot be redargued from any higher knowledge; and as original beliefs, they are paramount in certainty to every derivative assurance." "It will argue nothing against the trustworthiness of consciousness, that all or any of its deliverances are inexplicable—are incomprehensible. To make the comprehensibility of a datum of consciousness the criterion of its truth, would be indeed the climax of absurdity." (P. 745.)

The conclusiveness of this reasoning is disputed by many, who object, that consciousness (q.v.) is a very wide word, comprising indeed everything that we call mind; and it is proverbially unsafe to argue in generalities. Suppose, it is argued, we were to substitute "memory" in the above reasonings, and to maintain that the veracity of each one's memory was beyond all question or dispute, it would be apparent at once how the case really stands. In one meaning, and in one set of circumstances, memory is sure, or even, if we please, infallible—that is, when we record an observation the moment after we have made it. For a short interval of time, a simple fact, or a brief statement, may be recollected with entire certainty. On the other hand, the lapse of days, months, or years, and the complicity of the fact, not to mention the bias of the feelings, are known to cause great uncertainty in our recollection, and in such circumstances we do not implicitly rely on it. In a word, *experience* is the criterion of how far the memory is to be trusted. Possibly, therefore, the same thing may turn out to be true of the larger fact named consciousness.

The truths of C. S., or consciousness, are such as these: the laws of identity, contradiction, and excluded middle (see IDENTITY); the axioms of mathematics; the law of causality (see CAUSE); the doctrine of an innate moral sense (see ETHICS); the doctrine of man's moral liberty (see FREE WILL); the existence of an external world independent of every percipient mind. Such truths are designated by a variety of other names, with a view to contrast them with what we learn in the course of our education and contact with the world; they are termed intuitions, intuitive cognitions, instincts, feelings, beliefs, principles, ultimate or primordial elements, truths *à priori*, transcendental cognitions, truths of the reason, etc. See PERCEPTION.

COMMON TIME, in music, is that species of measure which contains two minims or two crotchets in a bar. It is marked thus:



COMMONWEALTH OF AUSTRALIA. See IMPERIAL FEDERATION.

COMMONWEALTH OF ENGLAND, the title of the government of England under Cromwell, from the death of Charles I., Jan. 30, 1649, to the restoration of Charles II., May 29, 1660. See CROMWELL, OLIVER.

COMMUNE, the smallest administrative division of France, much like the town and village local government organizations in the United States. The C. is a legal body, and can buy and sell property, contract debts, and appear in the courts. The chief magistrate is the *maire* (mayor), who is assisted by one or more adjuncts, and a deliberative assembly, called the *conseil municipal*. As the agent of the national government, the *maire* is charged with the local promulgation and enforcement of laws and decrees; and, as a member of the municipality, he has to attend to the police, the revenue, and the public works of the C., and in general to act as the representative of the corporation. In communes that rank as the administrative centers of a department, arrondissement, or canton, or that have a population of more than 3,000, the *maire* is nominated by the central government; in those not so distinguished, the appointment is made by the prefect of the department. The councilors are elected by the votes of the communal electors, and hold office for five years.

COMMUNE DE PARIS, the organized socialists and workingmen who revolted against the French government March 18, 1871, a few days after the evacuation of Paris by the Germans, subsequent to the long siege and capture. The national guard of Paris were permitted to retain their arms, and a large proportion of them joined in support of the commune. The more prominent among the leaders of the commune were Felix Pyat, Flourens, Assi, Delescluze, Paschal, Grousset, Gen. Cluseret, Dombrowski, Arnoud, Jules Valles, Blanqui, and Rochefort. Their principles are a subject of much dispute,

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but it is fair to quote this definition by one who belonged to the fraternity: "Their philosophy is atheism, materialism, the negation of all religion; their political programme is absolute individual liberty by means of the suppression of government, and the division of nationalities into communes more or less federated; their political economy consists essentially in the dispossession, with compensation, of the present holders of capital, and in assignment of the coin, land, etc., to associations of workmen." The same writer affirms that "the central committee of the national guard, exclusively composed of workmen, members of the Internationale, has taken the initiative, and alone has the merit of the movement." The national guard being divided in sentiment, the communists gained control of the city. Convicts released from the prisons, and foreign refugees, joined them. The more intelligent of the leaders, who had some moral scruples, were soon discarded, and desperadoes and outlaws obtained complete control. An election for the choice of members of the commune was held on the 26th of March, but the friends of order declined to vote, and the insurgents had an easy triumph. After the result was ascertained, the leaders issued a proclamation in these words: "The central committee has remitted its powers to the commune citizens; your commune is constituted. The vote of the 26th of March has sanctioned the victorious revolution," etc. The government at Versailles sent a force to suppress the insurrection. On the 2d of April, a body of insurgents marched against Versailles, but were repulsed at Meudon. Gustave Flourens, one of the commanders of the commune, was soon afterwards killed. The army of the republic, under command of Marshal McMahon, began the siege of Paris. Dombrowski, Cluseret, Rossel, and Delescluze, successively held command of the insurgent forces. The commune was torn with dissensions, which greatly diminished their power of resistance. On the 5th of April, they arrested the archbishop of Paris and others, and imprisoned them as hostages. Possessing several forts in the environs, the insurgents made an obstinate resistance to the advance of McMahon; but they were at length overcome. After capturing several of the forts, the besieging army, 90,000 strong, entered Paris by several gates on the 22d of May, and inclosed the insurgents in a semicircle; but the latter fought for five days behind barricades, committing atrocious acts of cruelty and vandalism. They set fire to the public buildings, and threatened the destruction of the ancient monuments and treasures of art. Among the fine edifices which they burned were the Tuileries, the Palais de Justice, the Palais Royal, and the Hôtel de Ville. The Louvre was partly consumed. They shot Darboy, archbishop of Paris; Boujeau, president of the court of cassation; and others whom they had held as hostages. In the execution of their incendiary schemes they ignited petroleum, gunpowder, and other explosive materials in many places. At length, on the 27th of May, the contest ended; 25,000 communists were taken prisoners, some of whom were put to death, while a number were sentenced to deportation. Delescluze was killed while fighting in the street. Most of the ringleaders who survived the battles were put to death. All but a very small number of those who were banished were amnestied in 1880.

There was a still older commune in Paris—that of 1790, which was created by law, but soon proved stronger than its creators. This commune bore a leading part in the worst outrages of that terrible era. See PARIS.

COMMUNICA'TIO IDIOMA'TUM, a term denoting the doctrine that the one person of Christ has conjoint possession of the attributes of two natures; the two natures being inseparable, so that whatever in either nature is proper to Christ in the abstract, belongs to him in the concrete.

COMMUNION signifies, in ecclesiastical language, that relation, involving mutual claims and duties, in which those stand who are united by uniformity of belief in one religious body or church. To exclude from this relation and its involved rights, is to *excommunicate*. The most visible symbol of this relation being the partaking together of the Lord's supper, that rite is often called the communion. See LORD'S SUPPER.

COMMUNION IN BOTH KINDS. It is universally acknowledged that in the primitive church, at the celebration of the Lord's supper, both the bread and the cup were distributed to all who communed. Sects which, like the Manichæans, discarded the wine were condemned as irregular. As, however, there was frequent occasion to carry the consecrated elements from the church to sick persons at their homes, it became customary, for convenience, to dip the bread in the wine, administering, in this way, both in one. At length it was thought more convenient to omit the wine. In the 13th c., Robert Pulleyn, of Oxford, approved the custom of giving to the laity the bread only, in order, as was said, to avoid the danger of spilling the wine. This view was adopted by the scholastic theologians, who taught that Christ was wholly present in the sacrament under either form, and that, consequently, one form was sufficient for a valid observance of it. Thomas Aquinas and Bonaventura, especially, advocated the administration of the communion under one form only. In proportion as the doctrine of transubstantiation was developed, it became the practice of the church to withhold the cup from the laity. Against this the reformers of the middle ages, as the Waldenses, Huss, Wyckliffe, and Savanarola, protested. The Protestant churches, also, were united in regarding the communion in both kinds as essential to the right observance of the ordinance. The practice of the Roman Catholic church was confirmed and made bind-

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ing by the council of Trent in 1563. It has always since been adhered to, and is defended on the ground that the cup is not necessary to the completeness of the sacrament. Since the whole Christ, as to his body, soul, and divinity, is not only in each species, but in every particle of both, he who receives the consecrated bread receives the whole Christ, and derives all the benefit from communing that the sacrament can afford. But while this law is uniformly enforced in the western Roman Catholic church, those portions of the eastern churches that acknowledge the supremacy of the pope are allowed to retain both forms; and the same toleration has been offered to Protestants in order to facilitate their return into the unity of the church under the Roman see. See LORD'S SUPPER.

COMMUNION SERVICE. See COMMON PRAYER-BOOK and LITURGY.

COMMUNISM, the name given to one class of the arrangements by which certain speculators have proposed to dispense with those laws of social and political economy which are supposed to keep society together, through the influence of the domestic affections and the spirit of competition, and to substitute in their stead a set of artificial rules for the government of mankind. The word socialist has generally been applied to those who only propose to interfere with labor by abolishing competition and wages, leaving men to work under the influence of public spirit, and making an equal division of the produce. See SOCIALISM. The term communist, on the other hand, has been applied to those who go a step further, and propose to abolish the relation of husband and wife, along with the system of domestic government which is founded on the parental authority. While Louis Blanc may be considered the head of the socialists—though his ultimate aim was work according to capacity, and payment according to wants—the representatives of the communists are Robert Owen, St. Simon, Fourier, Proudhon, and Enfantin. See COMPETITION.

Although we usually consider C. an especially French fallacy, the first consistent practical teacher of it was the English writer, Robert Owen. He published, in 1813, *A New View of Society, or Essays on the Principle of the Formation of the Human Character and the Application of the Principle to Practice*—in which he printed in large capital letters, as the key-note of his system, the following announcement: "That any character—from the best to the worst, from the most ignorant to the most enlightened—may be given to any community, even to the world at large, by applying certain means which are to a great extent at the command and under the control, or easily made so, of those who possess the government of nations." No alarm was felt either at such a text or the comments made on it; nor did the world see what the author meant by the hint that there were special artificial means for improving the breed, as it were, of mankind, until he struck at the root of the domestic organization, by such announcements as the following: "The affections of parents for their own children are too strong for their judgments ever to do justice to themselves, their children, or the public in the education of their own offspring—even if private families possessed the machinery (which they never do) to well-manufacture character from birth." He formed an organization, too complex to be here detailed, by which families were to be subjected to a discipline which, that it might be perfectly uniform, should be carried out in parallelograms. Anticipating the results, he said: "These new associations can scarcely be formed before it will be discovered that by the most simple and easy regulations all the natural wants of human nature may be abundantly supplied; and the principle of selfishness—in the sense in which that term is here used—will cease to exist, for want of an adequate motive to produce it." He attested his reliance on the efficacy of his invention by sinking his own fortune in an attempt to build a parallelogram. It was commenced in the year 1825, at Orbiston, in Lanarkshire; but he did not meet with sufficient co-operation, and as his own funds only sufficed to build one corner of the parallelogram, it was impossible to give effect to arrangements which were fitted only for a completed edifice in that geometrical form. A considerable number of people—about 200, it is said—lived for some time in the building, little to their own advantage or that of the neighbors, who were naturally prejudiced against them, and probably exaggerated their irregularities; the building was soon deserted, and afterwards was totally obliterated. Owen had another opportunity of trying his parallelogram organization in 1843, when "Harmony Hall" was established in Hampshire by the zealous efforts of his followers, who formed a sort of sect in England. Still, his theory had, as he deemed it, anything but fair-play, since so far did his disciples depart from that absolute undeviating conformity to the "rational" system, as laid down by him, that they got tired of his incessant reiteration of it, and deposed him from his office of "President of the Congress."

Attempts to realize C. abroad were not more fortunate. Fourier's system was to be realized in "phalanxes," each containing four hundred families, or about 1800 persons. A sum of about half a million of pounds is said to have been spent in the establishment of a "phalanstery" at Rambouillet. It failed, and the founder of the system, like Owen, attributed the failure to the scheme being but imperfectly developed. The St. Simonians established a college or corporation at Menilmontant, with a "supreme father" at their head. The leaders were brought to trial by the government of Louis Philippe, on a charge of undermining morality and religion. They were subjected to

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imprisonment, and not having public feeling with them, they were unable to bear up against the contumely thus thrown on them. See FOURIERISM.

Communism, in the sense of having all things in common, is not to be confounded with the idea for which the communists of Paris fought in 1871 (see PARIS); that idea was political rather than social, although the same persons may often hold both doctrines. *Commune* is the designation of the lowest administrative division in France, corresponding in rural districts to an English parish or rather township, and in regard to cities, being equivalent to municipality. The communist doctrine is, that every such commune, or at least every important city commune, like Paris, Marseilles, etc., should be a kind of independent state in itself, and France merely a federation of such states. This idea has taken deep hold of the extreme democrats, not only among the town populations of France, but also in Spain, and, to a less extent, in other parts of the continent. It was the very opposite idea for which the great civil war in the United States was fought and won. So far as America is concerned, the theory and practice of C. have made little progress. Socialism has been tried, and with some degree of success; but community of property and of interest has been emphatically rejected. In a land where all men are free, where all roads to prosperity and office are open to all men, where there is no caste, and, since the extinction of slavery, no degree of citizenship (except as relates to Indians and Chinese), there is little opportunity for those who would organize public robbery because one man has more acres or more dollars than another. Indeed, nearly all that has been heard in the United States in favor, or even on the subject of C., has been forced upon the public ear by discontented spirits from abroad. It is waste of time to prate about tyranny and kings where every man wears a crown. But since half a dozen screaming and worthless grasshoppers will make more noise in a clover field than ten thousand industrious and honest bees, we must perforce consider their noise and its purport. The very corner-stone and starting-point of the communists is the overthrow of the institution of private property, "that primary and fundamental institution on which, unless in some exceptional and very limited cases, the economical arrangements of society have always rested." Naturally the opinion that a communist is one who has no property to lose, and who therefore advocates a general re-distribution of wealth, is widespread and popular. Such movements against property have taken place in almost every country and in nearly every age. They have originated with men as far apart in time and intellect as Plato and Robert Owen, and with men as different in social surroundings as sir Thomas More, St. Simon, and Father Rapp. The mention of these names goes far to refute the popular idea that communists are always needy adventurers, seeking to possess themselves of the property of others. Among the modern leaders of C. who have actually reduced to practice the theoretical schemes of Plato's *Republic* and sir Thomas More's *Utopia*, have been some who have devoted great wealth and rare organizing faculty to the realization of their plans for the reconstruction of society. It has been estimated that during his life Robert Owen devoted as much as $300,000 of his own private fortune to the promotion of communistic schemes. He had a wonderful faculty for business, and to him the accumulation of money was natural and easy. The great pecuniary sacrifices made by him in the cause of C. showed that he at least was animated by motives the direct opposite of the selfishness and sloth generally attributed to the advocates of the system. Much the same remarks, so far as pecuniary interest is concerned, might apply to St. Simon of France, and to John Humphrey Noyes, the head of the Oneida community, in New York. In many countries the men foremost in thought and action have been more or less attracted by communistic schemes. These schemes have been so various in scope, and the amount of detail with which they are described by their authors is so considerable, that it is difficult to get at the underlying principle common to them all. It must be remembered that the philosophic C. of Plato and More has been adapted to the wants of actual daily life by rough German peasants and Lancashire cotton-weavers; and though, of course, the actual has differed much from the ideal commune, yet their resemblance is, under the circumstances, very much more striking than their divergence. In Plato's *Republic* the dissatisfaction is not limited to merely economical conditions. In his examination of the body politic there is hardly any part which he can pronounce healthy. He would alter the life of citizens of his state from the moment of birth. Children would be taken away from their parents and nurtured under the supervision of the state. The old nursery tales, "the blasphemous nonsense with which mothers fool the manhood out of their children," are to be suppressed. Dramatic and imitative poetry are not to be allowed. Education, marriage, the number of births, and the occupation of the citizens are to be controlled by the guardians or the heads of the state. Perfect equality of conditions and careers is to be preserved. The women are to have similar training with the men, and no career and no ambition is to be forbidden to them. The inequalities and rivalries between rich and poor are to cease, because all will be provided for by the state. Other cities are divided against themselves. "Any ordinary city, however small, is in fact two cities, one the city of the poor, the other of the rich, at war with one another," but this ideal state is to be a perfect unit; although its citizens are divided into classes according to their capacity and ability, there is none of the exclusive-

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ness of birth, and no inequality is to break the accord which binds all the citizens, both male and female, into one harmonious whole. The marvelous comprehensiveness of the scheme for the government of this ideal state makes it belong as much to the modern as to the ancient world. Many of the social problems to which Plato draws attention are yet unsolved, and some are in process of solution in the direction indicated by him. He is not appalled by the immensity of the task which he has sketched out for himself and his followers. He admits that there are difficulties to be overcome, but he says "Nothing great is easy." He refuses to be satisfied with half measures and patchwork reforms. "Enough! my friend!" he exclaims: "But what is enough when anything is wanting?" These sentences indicate the spirit in which philosophical as distinguished from practical communists, from the time of Plato until to-day, have undertaken to reconstruct human society. Sir Thomas More's *Utopia* has many of the characteristics of the *Republic*. There is in it the same wonderful power of shaking off the prejudices of the place and time in which it was written. The government of Utopia is described as founded on popular election; community of goods prevailed; the magistrates distributed the instruments of production among the inhabitants, and the wealth which resulted from their industry was shared by all. The use of money and all outward ostentation of wealth were forbidden. All meals were taken in common, and they were rendered attractive by the accompaniment of sweet strains of music, while the air was filled with the scent of the most delicate perfumes. More's ideal state differs in one important respect from Plato's. There was no community of wives in Utopia. Thus a oneness of the family relation and fidelity to the marriage contract were recognized by More as indispensable to the well-being of modern society. Plato, notwithstanding all the extraordinary originality with which he advocated the emancipation of woman, was not able to free himself from the theory and practice of regarding the wife as part and parcel of the property of her husband. The fact, therefore, that he advocated community of property led him also to advocate community of wives. He speaks of the "possession and use of women and children," and proceeds to show how this possession and use must be regulated in his ideal state. Monogamy was to him mere exclusive possession on the part of one man of a piece of property which ought to be for the benefit of the public. The fact that he showed no capacity to think of wives otherwise than as the property of their husbands only makes it the more remarkable that he claimed for women absolute equality of training and careers. The circumstance that communists have so frequently wrecked their projects by attacking marriage and advocating promiscuous intercourse between the sexes may probably be traced to the notion which regards a wife as being a mere item among the goods and chattels of her husband. It is not difficult to find evidence of the survival of this ancient habit of mind. "I will be master of what is mine own," says Petruchio; "she is my goods, my chattels." In More's *Utopia* we find the singular anomaly of slavery existing side by side with institutions which otherwise embody absolute personal, political, and religious freedom, Slaves he would have for all sordid services; and the institution of slavery was made supplementary to the criminal system, for the most part of the slaves were men who had been convicted of crime; and slavery for life was made a substitute for capital punishment. Besides the points mentioned, More's proposals comprise universal compulsory education, a reduction of the hours of labor to six hours per day, the employment of all adults, the most modern principles of sanitary reform, a complete revision of criminal legislation, and absolute religious toleration.

The point of education has been a strong one with theoretical and also with practical communists, as the labors of Owen in that direction clearly show. It is to be observed that communists have seldom relied on their peculiar system alone for the regeneration of society. Community of goods has indeed been their central idea; but they have almost invariably supported it by other projects of less questionable utility. Compulsory education, free trade, and law reform, the various movements connected with the improvement of the condition of women, have found their earliest advocates among theoretical and practical communists. They denounce the evils of the present state of society; the hopeless poverty of the poor, side by side with the self-regarding luxury of the rich, seems to them to cry aloud to heaven for the creation of a new organization. They proclaim the necessity of sweeping away the institution of private property, and insist that this great revolution, accompanied by universal education, free trade, a perfect administration of justice, and a due limitation of the numbers of the community, would put an end to half the self-made distresses of humanity. Has it never occurred to them that a similarly happy result might be attained if all these subsidiary reforms were carried out, leaving the principles of private property and competition to their old performance in the economic world? If the principles of C. and of private property are to be fairly compared, the comparison must not be between C. as it might be and private property as it is. C. to be successful requires to be accompanied by important reforms, towards which existing society, founded on private property, is gradually finding its way. The power which society, as at present constituted, has shown of adapting itself to altered circumstances, and of assimilating by slow degrees the more valuable concomitants of the most revolutionary theories, is strong proof that it does not deserve to be dealt with in the summary manner advocated by the communists.

For years Louis Blanc was the foremost advocate of C., and he took strong

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grounds against the education of the poor. In his work on the *Organization of Labor*, published in 1839, he says that in the existing order of society the spread of education among the masses would be dangerous—would, in fact, be impossible. This, if true, would be the strongest possible indictment against the existing order of society. But how have events falsified the assumptions made in the following passage—"We have seen why in the present system the education of the children of the people was impossible. Many thinking persons consider that it would be dangerous to impart instruction to the lower classes; and this is true. But do they perceive that this danger of education is an overwhelming proof of the absurdity of our social arrangements? Everything is wrong in the social order. Work is not held in esteem. The most useful trades are looked down upon. The workman is, to say the least, an object of compassion, while there are not found crowns enough for a ballet dancer. That is—yes, that is why it is dangerous to educate the people." Hence he concludes, a social revolution ought to be attempted; a new system of society ought to be introduced; the old system of society is, he says, so full of iniquities that it cannot co-exist with a diffusion of education among the people. Even at the time when these words were written there was much to show that they were not true. Since they were written the spread of education has been most general in those countries in which the old social order, founded on private property and competition is unshaken. Scotland and America have educated the people, and they are distinguished among other countries for possessing a peaceful, law-abiding, and order-loving population. So far from education being a danger to the institution of private property, nearly every one has been convinced by events that property is much more seriously threatened by ignorance and by the helpless desperation which ignorance brings; and the old order of society has recognized the necessity of protecting itself by the diffusion of education.

Passing over the war upon banks and banking made by Louis Blanc and his followers, and the equally bitter opposition by the German communists to the wonderfully successful credit banks of that country, which were devised for the express benefit of the laboring classes, we come to the question of excessive population, which is almost always one great cause of famines and deep depression among the poor. The greater part of communist writers passionately deny this, and denounce with much vigor the idea promulgated by Malthus that population tends to increase faster than subsistence is capable of being increased. No one, however, has attempted to throw a doubt upon the main fact on which the Malthusian doctrine rests, that everywhere, except in very new countries with a large extent of unoccupied fertile land, checks on population are in active operation. Such checks must exist everywhere where population does not increase at its greatest possible speed. Under favorable conditions population has sometimes doubled itself in 20 years. In the 38 years between 1767 and 1805 the population of Ireland doubled. At the rate of increase shown by the last census the population of England would double in 68 years, and that of France in 265 years. In the United States for the ten years before 1860 the increase was very nearly 4 per cent. per year, which would double the population once in 25 years. The civil war in the decade after 1860 renders a comparison for that period worthless. In France and England, therefore, checks on population are, in a varying degree, in active operation; and the same may be said of all old countries. These checks may be divided into two classes, the first carrying with it nothing but misery and degradation, the second implying a high degree of self restraint, independence, and foresight. In the first class may be placed war, pestilence, famine, and all the diseases incident to insufficient food and overcrowding. In the second class may be placed prudential restraint on marriage and the number of births to each marriage, and emigration. Every circumstance which weakens the efficiency of the checks on population comprised in the second class necessarily adds to the force of the checks which we have placed in the first class. In other words, any circumstance which relaxes the force of the prudential checks on population tends to produce the misery of famine, scarcity, and starvation diseases. What would be the effect of communism on the population? Would it strengthen or weaken the motives which promote a prudential limitation of numbers? Nearly all communists, whether theoretical or practical, have faced in one way or another the population question. But the theoretical communists of our times have hardly found words strong enough to express their detestation of the principle that any limitation is desirable to the possible number of births. The writings of Malthus are spoken of as "an outrage on household life." Louis Blanc says it is blaspheming God to say that the prosperity of the poor would be promoted by a limitation of the population. Why are you not logical? he cries; if you were you would recommend that the children of the poor should be put to death. And in another place he speaks of "this political economy without bowels, of which Ricardo has so complacently fixed the premises, and from which Malthus has drawn in cold blood the most horrible conclusions This political economy contained in itself a vice that was to make it fatal for England and for the world." But practical communists have met the question of population in a different spirit. Several of the most successful realizations of communistic life have maintained the strictest celibacy among their numbers. The Essenes, who practiced community of goods before the Christian era, were a sect composed entirely of men who lived in seclusion from the world, and were in many import-

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ant respects the prototypes of Christian hermits or monks. Two of the most important communistic societies in the United States have also made celibacy an essential feature of their system. The Economists and the Shakers, dating back respectively to 1805 and 1792, are strictly celibate, their numbers being recruited from the outside world and to a slight extent by the adoption of pauper children and orphans Among the Moravians marriage is not permitted to take place without the consent of the heads of the society, who furnish the newly-married with a suitable marriage portion. The Separatists, another American community of German origin, established in 1817, favor celibacy although they do not enforce it. No marriage can take place without the consent of the trustees of the society; and they further discourage marriage by entering among the articles of their religion a declaration of their belief that celibacy is more in accordance with the divine will than marriage. The Amana, another American community of German origin dating from the last century, discourages marriage among its members, and no man is permitted to marry under 24 years of age. Even the Perfectionists, who have a most extraordinary system of complex marriage, take many precautions against a superabundant population. The number of births is controlled by the heads of the society. The practical answer made by the communists to the population question, even in so wealthy a country as the United States, in which unoccupied fertile land can be easily and cheaply obtained, is that a strict limitation of numbers is absolutely essential to their social and industrial well-being. As a matter of fact the population of nearly all the American communistic societies has not increased at all, but has greatly declined during the last 60 years. In 1823 the Shakers numbered 3,800; in 1880 they were only 2,400. The Icarians, the only American community which makes marriage compulsory, have declined in 25 years from 1500 to 65.

It should not, however, be concluded from these facts that the general adoption of C. would tend to strengthen the prudential checks on population. We have seen that modern communists, when freed from the trammels of actual experience of the daily working of the system which they advocate, have vigorously denounced the theory and practice of Malthusianism. The American communists have declined in numbers partly in consequence of the adoption into the communities of celibacy as a religious principle. It is also impossible to avoid the conclusion that their numbers have fallen off partly in consequence of the unattractive conditions of communistic life. The young members of these societies not unfrequently leave them when they arrive at manhood or womanhood. The routine and absence of spontaniety of a communistic life is a weight to young and active minds that is not counterbalanced by a security from want, or a mere bread-and-butter prosperity. The number of marriages and births has been controlled in others of these societies in virtue of the absolute despotism which is vested in the chiefs; individual liberty is entirely suspended; the smallest minutiæ of the daily life of their members is regulated from headquarters. "A government which decides at what hour its subjects shall go to bed at night and rise in the morning, which prescribes the color, shape, and material of the dresses worn; the time of meals, the quality and quantity of food, and the daily task apportioned to each member; which enforces a rule that each of its subjects shall leave every morning a notice stating at what exact spot he or she will be found during each hour of the day; a government which can do all these things will find no great difficulty in controlling the number of marriages and births. The fundamental principle of communal life is the subordination of the individual's will to the general interest, or the general will. Practically this takes the shape of unquestioning obedience by the members towards the elders or chiefs of their society." If, however, C. were adopted throughout a whole nation, the minute despotism which now distinguishes the government of existing communistic societies, and which furnishes them with an effectual control over the growth of population, would cease to be possible; or if, indeed, it should ever become possible it would be through the careful supervision of individual liberty, and through the strenuous encouragement of everything which tended to destroy self reliance on the part of the people, and to build up the absolute power of the state. A people who purchased material prosperity at the price of their liberty would strike a bad bargain, especially when it is remembered that the limitation of the number of marriages and births which is enforced by the central authorities in a communistic society can be effected by voluntary self-control in a society based on private property and competition. The difference, therefore, as far as the population question is concerned, between communistic and private property is whether the necessary restraint upon the possible number of births shall proceed from the direct intervention of the state, or whether it shall proceed from the combined motives of self-interest, self-control, and parental obligation on the part of the people themselves. It should be remembered that what communists profess to be able to do is to insure to every member of a communistic society an ample supply of the necessaries and conveniences of life. If the population question is pressing when the almshouse and charitable contributions are the only refuge of those who cannot maintain themselves, would it not become much more pressing if a man could obtain freely, and without fulfilling any disagreeable conditions, food, house, and clothing for himself, and as many children as he chose to bring into existence? It is this consideration which has forced upon the government of communistic societies the control of the marriages and births of their members. Wherever the principles of C. are adopted in

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so very materially modified a form as they are in the English poor-law system, legislative control over population has been enforced. The regulation which separates husband and wife in the workhouse is a practical recognition of the principle that where the state guarantees a maintenance it must, in self-protection, exercise control over the members of those dependent on it for support. Self-help brings with it self-control; state help makes state control indispensable. In the present economic condition of society the solution of the population question is not to be found in placing in the hands of the state, as C. has done, absolute control over domestic life. The solution of the problem must be sought in education, in an improved standard of comfort, and a determination on the part of the people not to sink below it, and in a reform of the poor laws and in systems of indoor and outdoor relief.

There are some charges made against C. which may be brought with at least equal force against the economic and industrial arrangements which now prevail. One of these is that C. does not avail itself sufficiently of the motive of self-interest, in order to obtain from each laborer the best and most conscientious work of which he is capable. If, it is urged, the result of man's industry belongs not to himself solely, but to the whole community of which he is a member, he will not throw the same energy and zeal into his work as he will if everything he produces belongs solely to himself. There can be no doubt of the truth of this statement; self-interest is a force on which industrial machinery chiefly relies for motive power. But it is remarkable that the prevailing system of working for fixed weekly wages checks the play of self-interest in the workman much more completely than it is checked in the communistic society by the fact that the results of the labor of each are shared by all. A workman who is in the receipt of fixed weekly wages has no motive to reach any higher standard of excellence or expedition in his work than such as will prevent him from being discharged for bad work or laziness. It is a complaint constantly heard among employers of labor that the only ambition of the men seems to be the doing the least work possible for their wages. The actual existence of the feeling among workmen is proved by many of the rules of trades' unions—such as that which limits the number of bricks which a hod-man is allowed to carry, and which in one case forbade the use of wheel-barrows in taking bricks from one spot to another. Thornton's book *On Labor* gives several examples of the rules adopted by trades' unions to check the tendency which is sometimes found in a workman to exert himself to do his best, and thus show his superiority over his fellows. "Not besting one's mates" has by several English unions been made a social enactment. Such examples are sufficient to show that the present industrial system does not bring into play the motive force of direct self-interest in stimulating the exertions of the laborer. In this respect C. would seem at first sight to compare favorably with mere wages-receiving industry; for in a communistic society every man and woman has some direct share, however small, in the result of his or her labor. If more is produced, there will be more to receive; and instead of a trade union, every member of which is pledged, under penalties, to work slowly and to watch that his fellow-workmen do the same, C. gives to each laborer a direct interest not only in working well himself, but in watching to see that honest and steady work is done by his neighbor. As a matter of fact, the American communistic societies have found no difficulty in enforcing the habit of careful and regular industry on their members. The American communists do not as a rule work hard, for they find that they provide for all the wants of the community without excessive or exhausting toil; but there are no idle members; every one works well and steadily while he is working. That the quality of their work is good is proved by the fact that their commercial reputation stands very high. The garden seeds of the Shakers, and their brooms, have been celebrated all over the United States for their excellence. "The Oneida perfectionists established the reputation of their silk twist in the market by giving accurate weight and sound material; the woolen stuffs of Amana command a constant market, because they are well and honestly made; and in general they (the communists) have a reputation for honesty and fair dealing among their neighbors wherever their products are bought and sold." It should, however, be remembered that a few successful communists afford no test of what would be the effect of a general adoption of C. on industrial activity and efficiency. In the United States there are only about 4,000 communists, children included; and though there are eight different societies, these are divided into 32 separate communities, the Shakers alone having 18. On an average, each community consists of less than 70 persons. The elaborate despotism of communistic government, together with the minute surveillance which the small size of these communities renders possible, makes it easy for the leaders to exact from each member his quota of toil; idleness would be at once detected, and would not be suffered to exist, as the power of expelling an idle member would be resorted to if the voice of public opinion were not sufficient to induce him to mend his ways. Similar means of detecting and preventing idleness would be completely absent if C. were generally adopted. There would, of course, in this case be no power of expelling an idle member, and the difficulty of detecting and proving to the central authorities a disposition on the part of any of the members to avoid a fair share of work would increase step by step with the increase of the size of the community. The motive of self-interest in promoting good work is much more powerful in a small communistic society than in a large one. A man can appreciate the value of his own industry much

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more clearly if the resulting product is shared between 30 or 40 persons, every one of whom is known to him, than he can if it were thrown into the common stock of 20,000 people. The weakening of the motive of self-interest which is inherent in C. is reduced to a minimum in small communities; but it would act with fatal results to industrial activity if there should ever be an attempt to make C. universal. For much as the present system falls short of making the most of the great engine of self-interest among those who merely work for wages, there is no such feature among the other industrial classes. Capitalists, land-owners, inventors, traders, members of partnerships, members of co-operative societies, all are brought under the stimulating influence of self-interest, and thus devote themselves to industrial projects with a zeal completely and necessarily unknown among those who work for wages, or those who are members of communistic societies. It is a special feature of co-operation that it brings the motive of self-interest into activity among manual laborers without attempting, as C. does, to overthrow all existing economic institutions. It takes these as they are, and men and women as they are, and suggests a means by which the laborer, no less than the capitalist, can be stimulated by direct self-interest to throw some energy and enthusiasm into his work.

While it has built up co-operation, C. as a system has been a signal failure. In France, the names of St. Simon, Fourier, Bazard, and Enfantin are synonymous with disaster. In England the name of Owen recalls the brief existences of Harmony hall and Orbiston, the establishment of the labor exchange and the issue of labor notes, and a number of other schemes which raised great hopes and expectations that were doomed to speedy disappointment. In the United States the success of C., such as it is, is hardly more encouraging than its failure in Europe. The measure of material prosperity achieved is not very considerable, bearing in mind the length of time most of the societies have existed and the ease and cheapness with which unoccupied land can be obtained. Nordhoff estimates the capitalized wealth of the 72 American communities at $12,000,000. They own from 150,000 to 180,000 acres, or about 36 acres to each person; they possess some of the most fertile soil in the world; one of the Shaker villages owns a magnificent estate of 4,500 acres lying in the famous Miami valley, a soil much of which is so fertile that after 60 years of cropping it will still yield from 60 to 70 bushels of corn to the acre without manuring. The material condition of the inhabitants of the communistic villages compares favorably, no doubt, with that of the German peasant by whom the majority of American communes were originally started; but the monotony, the personal submission, the impossibility of privacy or temporary seclusion, the absence of anything like intellectual activity in these societies, would render the life well-nigh unbearable to people who had been previously accustomed to a higher standard of happiness than that at present within the reach of the ordinary day laborer. Many communistic experiments in the United States have been unsuccessful. Noyes, in his book on *American Socialism*, gives brief histories of no less than 47 of these failures. Comparing the histories of those societies which have died a natural death with that of those which have continued to exist, it is found that the successful societies had no advantage either in the wealth of their members or the intellectual ability of their leaders. Most of the successful societies began poor; most of the unsuccessful societies began with what were believed to be sufficient means to achieve success. Many of the unsuccessful societies were founded by high-minded, highly cultivated men and women, and their members were distinguished for education and intellectual attainments. From these facts, and with ample means through personal experience for forming a correct opinion, Mr. Nordhoff draws the conclusion that in a communistic experiment success depends upon a feeling among all the members "of the unbearableness of the circumstances" in which their lives were originally cast. They must have suffered from wrong and oppression, as well as from want, before C. can appear as a welcome change in their manner of life. Hence the poorer and more narrow and miserable the condition of the people who start a communistic experiment the more likely it is under judicious leaders to succeed. People are easily satisfied when almost any change in their lives must be for the better. It would be undesirable to detract from the achievement of the American communes in raising the poorest and most miserable to a degree of material prosperity which compares with that of well-to-do small farmers in any country. This is no small feat; as they have also proved the possibility of putting C. into practical forms at least on a small scale, and under exceptionally favorable economic conditions. But it is impossible to doubt that their practical value to the world has been in illustrating the limitations and drawbacks of the system. As long as C. remained an unexplored region given over to the dreamers of dreams and the seers of visions, it was impossible to prove that it did not possess all the marvelous perfections which they fondly attributed to it. The American societies offer a life which is confessedly attractive only to those whose original circumstances are exceptionally unfortunate. To those, C. can give, together with a congenial religious atmosphere, material prosperity of a humble type, accompanied by the sacrifice of individuality, liberty, privacy, and intellectual development. It can hardly be denied that these experiments prove that, even were C. on a large scale practically possible, it would never satisfy the aspirations of those who look for a time when increased material prosperity among the working classes, shall be accompanied by a corresponding increase of intellectual activity, political responsibility, and personal independence. The old form of

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society seems more favorable than C. to the growth of these qualities; and it is probable that the experiments in the United States may help to establish the conviction among economic revolutionists that more can be accomplished by grafting new institutions, such as co-operation, on the old plan of private property than can be achieved by rooting it up altogether and planting the seedling of C. in its stead.

The reader is referred to De Cassaignac, *General Idea of the Commune* (1871); James, *Communism in America* (1879); Woolsey, *Communism and Socialism* (1880); Coghill, *Essay on Communism and Socialism* (1880); Coutzin, *Geschichte des Socialismus und Communismus* (1881); Proudhon, *Œuvres Complètes* (last ed., 1883); Ely, *French and German Socialism* (1883); Gronlund, *The Co-operative Commonwealth* (1887); Dodd, *The Republic of the Future* (1887); Bruce Smith, *Socialism and Communism* (1887); Bouchot, *Etudes de Sociologie* (1889).

COMMUTATOR. See DYNAMO: INDUCTION OF ELECTRIC CURRENTS.

COMNE'NUS, the name of a family originally Italian, of which many members occupied the throne of the Byzantine empire from 1057 to 1204, and that of Trebizond from 1204 to 1461. See BYZANTINE EMPIRE and TREBIZOND.—ANNA COMNENA (q.v.), who lived in the first half of the 12th c., is both of historic and literary celebrity.—DAVID C., the last representative of the imperial race in Trebizond, was executed at Adrianople in 1462, with all his family, by command of Mohammed II. The attempt which has been made to trace the descent of the Bonaparte family from a branch of the Comneni settled in Corsica, is not supported by valid evidence.

CO'MO, a province of Lombardy, Italy, on the border of Switzerland; 1091 sq.m.; pop. '95, 571,935. It is a mountainous region, with many small lakes and several rivers, the Adda and Ticino being the most important streams. The products are corn, wine, fruit, silk, etc.; and there are mines of copper, lead, and iron, and quarries of white marble. There are also manufactories of cloth, silk, and woolen goods, paper, firearms, etc. This province was ceded to Italy by Austria in 1859.

CO'MO, a city of Lombardy, northern Italy, beautifully situated at the s.w. extremity of the lake of Como. It lies in a valley, surrounded by hills, clad with luxuriant gardens, olive-plantations, and orange-groves, with here and there an old ruin cropping out. The city is surrounded by old walls flanked with towers, the gateways by which the walls are pierced being fine specimens of middle-age military architecture. Among the principal buildings of C. are the cathedral, built of marble, and containing some interesting pictures and monuments; the town-hall, also of marble, dating from the beginning of the 13th c.; and the churches of San Fedele and St. Abondio. There are also many fine mansions of the nobility in C. and its suburbs. The port of C., on the lake, is formed of two piers, each terminating in a square pavilion, from which magnificent views are obtained. The inhabitants—including the suburbs—numbered (1894) 32,300, and are very industrious. It has a variety of manufactures, among which may be mentioned the production of silk and cotton fabrics. By means of its port, C. carries on extensive trade in the produce of the district with Switzerland. C., in the time of Pliny the younger, had attained to a high degree of prosperity as *Comum Novum.* With the fall of the Roman empire, C. passed out of sight until 1107, when it began to war with Milan, and in the course of twenty years was utterly destroyed by its antagonist. It was rebuilt in 1155 by Frederick Barbarossa, and remained a republic for two centuries, when it fell into the hands of the Viscontis, its history since that time being bound up with that of Milan.

COMO, LAKE OF (Ital. *Lago di Como,* ancient *Larius Lacus*), a sheet of water in Lombardy, northern Italy, lying at the foot of the Lepontine and Rhetian Alps, chiefly formed by the river Adda, which enters it at its n., and issues at its s.e. extremity. The total length of the lake from Como to Riva is about 35 miles. About 15 m. from its northern extremity, the promontory of Bellagio divides it into two branches, the longer of which is between 18 and 20 m.; the other branch is about 12 m. long. The three arms of the lake sometimes receive different names—the upper part as far as Bellagio being called the lake of Bellano; the longer branch, on which the town of Como is built, the lake of Como; and the shorter, the lake of Lecco. Lake Como, however, is the general designation. The greatest breadth of the lake is not more than 3 m., but throughout the greatest part of its length, it is much less. The beauty of the surrounding scenery, and the salubrity of the climate, have made the lake of C. the most celebrated and most resorted to in Italy, its shores being everywhere studded with fine villas. Queen Caroline once had a residence here. Numerous steam-boats ply upon the lake.

COMONFORT, YGNACIO, 1812–63; a statesman and president of Mexico. He was a member of congress in 1842, and a senator six years later. In 1854, he assisted Alvarez against Santa Anna, and on the resignation of Alvarez he became provisional president. He was proclaimed president in 1857, and in 1858 he was driven into exile. In 1863, he commanded an army to oppose the French invaders who intended to establish Maximilian in power. Near the close of the year, he was assassinated by banditti.

COMORIN', CAPE, the most southerly extremity of the peninsula of Hindustan, being, in fact, a sandy accretion to the termination of the Western Ghauts; while, on the outside of it, are a few detached rocks as a natural breakwater. The headland itself is

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so low as not to be visible at the distance of more than 10 m. from the deck of a large ship; and, long before it can be itself distinguished, it is fixed in position, to the eye of the approaching mariner, by a conspicuous peak of the great chain behind it. Its lat. and long. are 8° 5′ n. and 77° 37′ e. Cape C. is in the protected principality of Travancore; and close to it there stands, amid a clump of trees, a village of the same name, with a few fishermen's huts, some venerated temples, and a Dutch church.

COMORN, a co. in Hungary on the Danube; 1145 sq. m.; pop. '90, 159,397, nearly all of whom are Magyars. The n. portion is fertile; the s. mountainous. A very excellent wine is produced. Its principal town is Comorn.

CO'MORN, properly Ko'MORN, a t. and fortress in Hungary, situated on the island of Schütt, at the junction of the Waag and the Danube, which is here crossed by a bridge of boats, 46 miles w.n.w. of Pesth. This island is remarkable for its fertility, as is, indeed, the whole surrounding district. The town, which is irregularly built, with narrow, gloomy streets, contained (1890) 13,076 inhabitants, almost exclusively Magyar. The fortress was erected by Matthias Corvinus, and was restored at great expense in 1805. Its works and intrenchments extend about 7 m. along the banks of the rivers, and it requires for its defense at least 15,000 men and 400 pieces of artillery. It has the reputation of being impregnable, and justified it in the Hungarian war, for the Austrians besieged it in vain from Oct., 1848, to Sept., 1849, and only became masters of it at last in virtue of a capitulation. It has manufactures of woolen and leather, and an active trade in corn, wine, honey, fish, and timber.

COM'ORO ISLES, a group of four islands in the Mozambique channel, between Africa and Madagascar, in lat. 11° to 13° s., long. 43° to 45° 30′ east. The islands, which are of volcanic origin, are called Angaziya or Great Comoro, Anjouan or Johanna, Mayotta, and Mohilla. They are mountainous, the highest peaks rising above 6,000 feet. The soil is fertile. The inhabitants, about 50,000 in number, are principally Mohammedans, but fetichism prevails to some extent. The manufactures are coarse cloths, jewelry, and fire-arms. The island of Mayotta was ceded to France in 1842, and the remaining ones added, 1886. Here the cultivation of sugar has been encouraged. The people of Johanna find their principal employment in connection with ships calling for provisions. The trade of Comoro and Mohilla is of the same character, but these islands are not so much frequented by ships for the purpose of victualing.

COMPANION, the framing and sash-lights on the quarter-deck of a vessel. Companion Hatch is the hood or covering over the staircase leading to the cabin. Companion Ladder is the one by which officers mount to, or descend from, the quarter-deck. Companion Way is the staircase leading to the cabin.

COMPANY. See JOINT-STOCK COMPANY and PARTNERSHIP.

COMPANY, in military organization, is an aliquot part of a regiment or battalion. In the British service, the companies in an infantry regiment are generally ten or twelve, or, if there are two battalions, each has this number of companies. The arrangement is made to facilitate command and evolutions. The capts., lieuts., and sub-lieuts. are all *C. officers*. The capt. is the chief of the C., and the lieut. and sub-lieut. are his subalterns or assistants. The C. is further separated into two *subdivisions*, of two sections each. In round numbers, and without reference to special instances, a full C. may be considered to comprise about 100 men, a subdivision 50, and a section 25. Under the capt.'s superintendence the lieut. commands the first and second sections, the sub-lieut. the third and fourth, with a sergt. to each section. Each C. has its own arm and accouterment chests, and keeps its own books. A cavalry regiment is subdivided into *troops* instead of companies; the engineers and marines, into companies; but the artillery corresponding term is *battery*. In the German army, a company comprises about 250 men, under a capt., who is a mounted officer, and three subalterns.

In the United States regular army, all branches of the service are divided into companies. Infantry companies in time of war are expected to number about 100 men. A battalion of infantry has 10 companies, and each company has a capt. and two lieuts. In the cavalry, a company is sometimes called a troop, and in the artillery a battery.

COMPANY, of a ship, is considered to include the whole of the persons engaged on board, and paid for specific duties—exclusive, therefore, of troops and passengers, but including naval officers as well as crew. See CREW.

COMPANY, JOHN. The popular name for the old East India Company (q.v.).

COMPARATIVE ANATOMY. See ANATOMY.

COMPARATIVE ANATOMY, is the term employed to express that branch of anatomy in which the construction, form, and structure of two or more animals are compared with each other, so as to bring out their features of similarity or dissimilarity. It is sometimes used, in contrast with the term human anatomy, to signify the anatomy of the lower animals, but this is an inexact use of the term, as the anatomy of man may be made comparative when it is examined in comparison with that of animals. The study of comparative anatomy is of especial importance to the physiologist, the embryologist, the veterinarian, and the zoologist. To the physiologist because, from the comparison of the bodies of different animals with each other, modifications in the size, form, and structure of any particular organ can be traced, and conclusions can be

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drawn on the importance of the functions of the organ in the economy. Moreover, with a knowledge of comparative anatomy, the physiologist can conduct experiments on animals which have organs similar in structure to those of man, and determine their functions more precisely than would be possible in the human body. To the veterinarian a knowledge of the comparative anatomy of the domestic animals is essential to the study of their diseases. To the embryologist, a knowledge of the anatomy of different animals throws light on the signification of the structural changes which the body of any particular animal passes through in the course of its development. To the zoologist, a knowledge not only of the external form but of the internal structure of animals is essential in order that he may frame a precise system of classification.

COMPARATIVE GRAMMAR. See GRAMMAR.

COMPARATIVE MYTHOLOGY. See MYTHOLOGY.

COMPARATIVE PHILOLOGY. See PHILOLOGY.

COMPARETTI, DOMENICO, philologist, was born in Rome, June 27, 1835. He studied mathematics and the natural sciences, then he held a position in a library, and became professor of Greek in the university of Pisa in 1859. A few years later he became professor of Greek in the Instituto di Studii Superiori, at Florence. He contributed frequent articles to the journals, also published several learned works, one on Greek dialects in South Italy (1866), on Virgil, the Magician (1872), and on Homer and Pisistratus (1881). His best-known work is *Researches concerning the Book of Sindbad.* He also edited the *Canti et Racconti del Popolo Italiano* (1869, *et seq.*). In this latter work he was assisted by D'Ancona.

COMPARISON, in grammar, and as applied to adjectives (q.v.), is that which marks the *degree* in which the quality is attributed to the object, as compared with other objects. There are three degrees of comparison. The *positive* indicates the quality generally, without comparison; the *comparative*, a higher degree of the quality than is attributed to other things; and the *superlative*, the highest degree that is attributed to any of the things under consideration. There are two ways of expressing these degrees. 1. By an inflection or change on the word; as, *hard, harder, hardest; happy, happier, happiest.* This mode prevails almost exclusively in Greek and Latin. 2. By an additional word, as *more happy, most happy.* This may be called logical C.; the other, grammatical. In French, with the exception of a few irregular adjectives, all adjectives follow the logical method. In English, the logical method is preferred in every case where the grammatical would produce a word difficult or harsh in the pronunciation. This is generally the case in English when the simple adjective is of more than one syllable; but it is not always so. Thus, *éarnester, prúdenter*, would make harsh combinations; not so *políter, discréeter, háppier.* The difference is, that in *éarnester, prúdenter*, the accent being on the first syllable, two unaccented syllables of discordant character are thrown together; in *políter, discréeter*, the unaccented syllables are separated; and in *háppier*, though they come together, they are of a kind readily to coalesce. Thus, the laws of euphony—which mean, the ear and organs of speech consulting their own convenience—determine this point, as they do much else in language. In general, it is only adjectives of quality that admit of C.; and even adjectives of quality cannot be compared when the quality does not admit of degrees; as, a *circular* spaces, a *gold* ring, a *universal* wish.

Adverbs (q.v.) are compared exactly like adjectives.

COMPASS, the range of notes which any voice or instrument is capable of producing.

COMPASS, MARINER'S, is the name given to the instrument by which sailors are enabled to steer their course on the ocean out of sight of land, and when neither sun nor stars are visible. The ancients, to whom it was unknown, could seldom venture to lose sight of the coast. The directive power of the magnet seems to have been unknown in Europe till late in the 12th century. It appears, however, on very good authority, that it was known in China, and throughout the east generally, at a very remote period. The Chinese annals indeed assign its discovery to the year 2634 B.C., when, they say, an instrument for indicating the s. was constructed by the emperor Hou-ang-ti. At first, they would appear to have used it exclusively for guidance in traveling by land. The earliest date at which we hear of their using it at sea is somewhere about 300 A.D. According to one account, a knowledge of the C. was brought to Europe by Marco Polo, on his return from his travels in Cathay. It was long contended that the C., as a nautical instrument, was first invented by Flavio Gioja, a native of Amalfi, about the year 1362; and that that part of the kingdom of Naples where he was born has a compass for its arms. For this there is no authority whatever, as the C. was well known as a nautical instrument before his time. It is probable, however, that Gioja may have made some improvement in the instrument or in the mode of suspending it.

The essential part of the C. is the magnetized needle, balanced freely upon a fine point; such a needle has the property of arranging itself in the meridian, one end always pointing to the n., and the other to the s. (see MAGNETISM); yet not exactly, but with a deflection or *declination* (q.v.), which varies from time to time in magnitude, and may be towards the w. or the east. The form of the needle is various, some being long flat prisms, others lozenge-shaped. The center of the needle is pierced, and a piece of

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agate generally inserted, with a conical hole sunk in it, to receive the fine point of the steel pin, so that the free motion may not be hindered by friction. The construction of the rest of the instrument depends upon the purpose it is to serve. For a mariner's C., the needle is fixed to a circular card, on which there is a star of 32 rays marking the 32 *points* of the heavens. The n. point of the card is immediately over the n. end of the needle, and the card moves with the needle. The cardinal points are marked with the letters n., s., e., w.; and the intermediate points other letters. The points are often subdivided into quarters, which are thus marked: n.¼e. (read "n. one fourth e."); n.½e.; n. by e.⅛e., etc. A point of the C. being $\frac{1}{32}$ of the circle, is equal to 11° 15'. The C. thus formed is inclosed in a cylindrical brass box; and in order that the C. may remain horizontal in all positions of the ship, the box is suspended by gimbals (q.v.). The whole is then placed in the binnacle (q.v.), in sight of the helmsman. Inside the box, in the direction of the ship's bow, is a vertical black line called the *lubber-line*, and the steersman must keep the point of the card which marks the prescribed course always in contact with the black line. Compasses differing in some respects from the mariner's C. are also used in surveying and land-measuring; and for the miner they are perhaps as necessary as for the sailor.

The great difficulty connected with the use of the mariner's C. arises from the disturbing influence of the magnetism of the ship. The difficulty is particularly felt in iron vessels, where the deviation of the needle is frequently so considerable as to render the compass almost useless. Various means of obviating this have been suggested; one of these is to place bars of soft iron or magnets in the immediate neighborhood of the binnacle, which being so placed as to cause a contrary disturbance to that of the iron of the ship, leave the needle comparatively free. This is found to answer well in iron ships plying between British and continental or North American ports; but where, as in the Australian passage, they change considerably their latitude, such an arrangement is found to be worse than useless, as the magnetism of the vessel changing with the magnetic latitude, causes an ever-varying deviation of the needle. It has likewise been suggested to place a compass as a standard at the mast-head, where it would be comparatively free from the attraction of the vessel, by which the ship's course might be shaped, the ordinary C. being used merely to give immediate direction to the steersman. In the royal navy, this error is to a large extent obviated in the following way. A C. is placed so high above the deck as to clear the bulwarks, and allow the bearings of a distant object on shore or a heavenly body to be taken while the ship's head makes a complete circuit. In this way, the deviation caused by the iron of the ship in all different positions may be ascertained.

COMPASSES, instruments for transferring and marking off distances, or for drawing circles, ellipses, etc. The *common C. or dividers* are simply two rods or "legs" joined together at one end by a pivot-joint, and pointed at the other; when used for drawing circles, the lower part of one of the legs is replaced by a pen or pencil. *Spring dividers* are much in use by workmen; in these, the legs are united by a strong steel spring, the action of which is to stretch them open; but half-way down, a screw passing between the legs, regulates the degree of opening. The value of these depends upon the permanency with which they retain any degree of opening given to them, pivot C. being liable to slip.

Beam C. consist of points sliding on a long bar, to which they may be clamped at any distance from each other. They are used for greater openings than pivot C. can safely span, and, when delicately made, for more accurate dividing. See GRADUATION.

Proportional C. have a point at each end of each leg, and the pivot between, thus forming a double pair of C. opposite to each other, end to end. If the pivot is midway between the points, the opening of each pair of points will be equal; if the distance from one pair of points be double that from the other, the openings will be as two to one; and so on for any ratio. When a single fixed proportion only is required, the pivot is fixed accordingly; but to adapt them for variable proportions, the pivot is a clamping screw, which moves in an elongated interval in the legs, and may be fixed at any point.

Triangular C. have three legs, so that the points of a triangle may be all transferred at once.

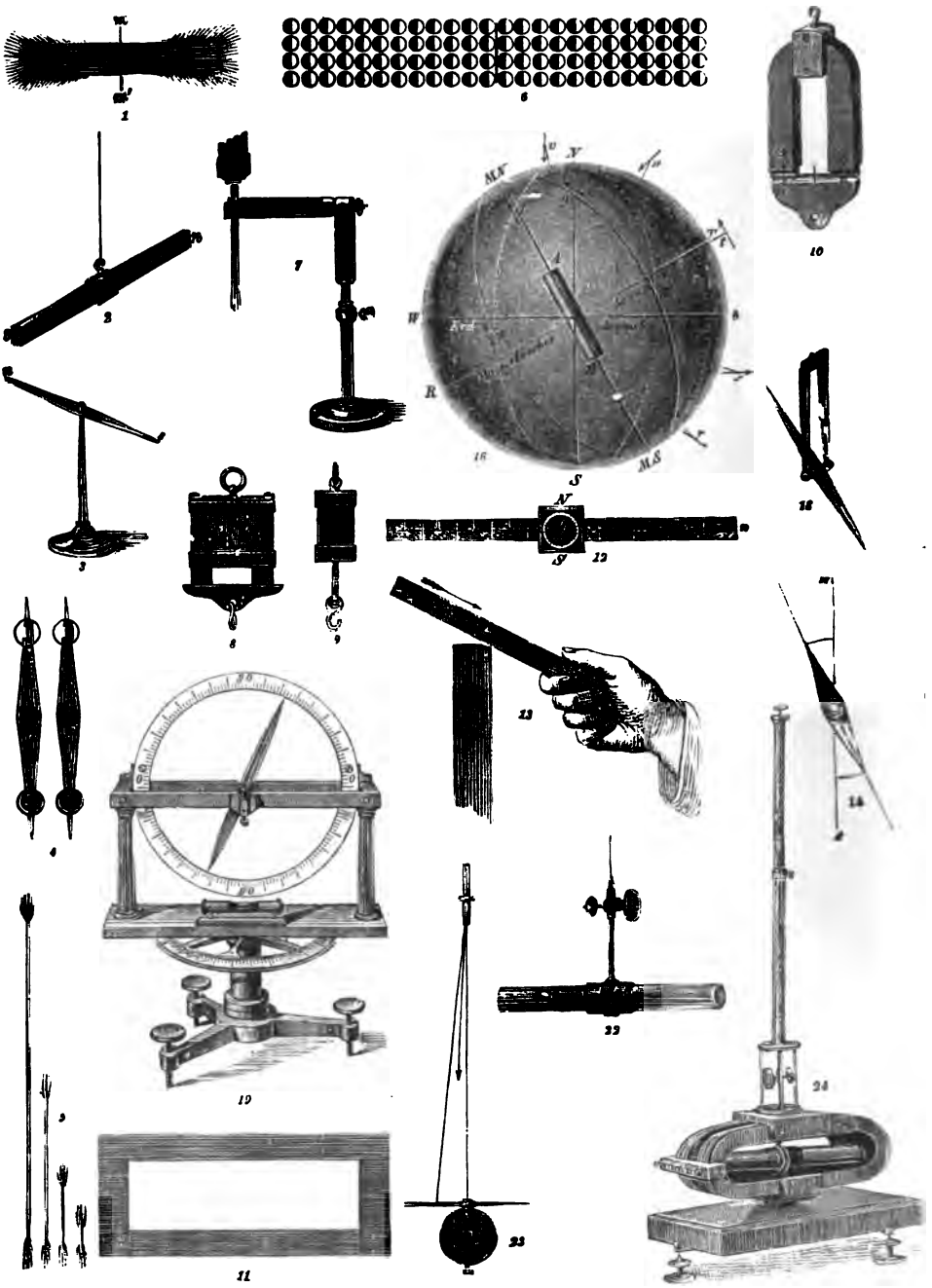
Calliper Compasses. See CALLIPERS.

COMPASS PLANT, called also "resin weed," because it abounds in resinous matter; a large plant growing on the prairies, whose leaves are said always to point directly or nearly n. and s. When cultivated in gardens this property does not always appear. Its botanical name is *Silphium laciniatum.*

COMPASS, SOLAR, an instrument for determining at any place an accurate n. and s. line. It has a range of about 35°, and may be adjusted to the latitude of any place in the United States. It has a latitude arc, a declination arc, and an hour arc, each to be duly adjusted for an observation; and has been found of much service in running important boundary lines, and other government surveys. One of its recommendations is its avoidance of the perplexities caused by local attraction. It is the invention of William A. Burt, of Michigan.

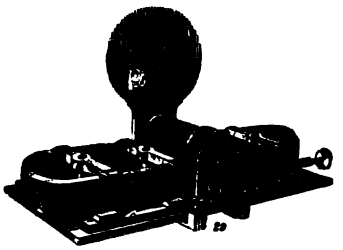
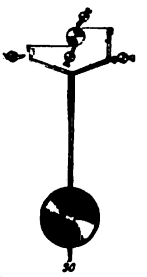
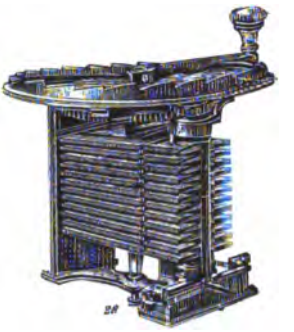
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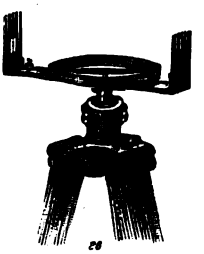
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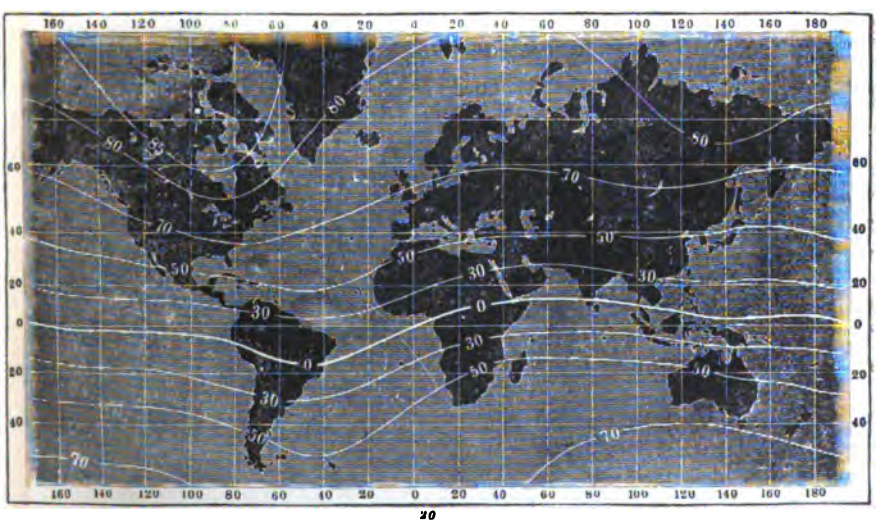
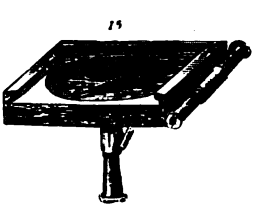
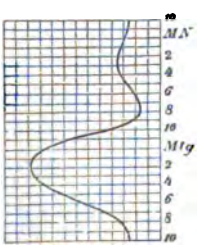
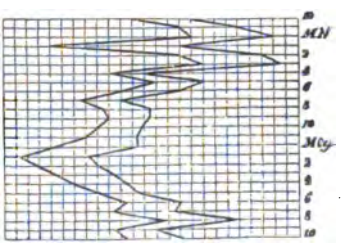


THE COMPASS, MAGNETISM, POLARITY, ETC.—1. Magnetic poles. 2. Magnetic rod (suspend
broken at various points. 6. Illustration of magnetic polarity. 7. Magnetizing ir
12. Action of amagnet at a distance. 13. Magnetization by friction. 14. Declinati
terrestrial sphere. 17. "Jacob's staff." 18. Magnetic inclination. 19. Inclinatorium
25. Magnetic variations or disturbances. 26. Surveyor's compass. 27-30. Magneto-el

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spended). 3. Magnetic needle. 4. Magnetic needles with marked poles. 5. Magnetic staff, ng iron. 8, 9. Natural magnet, armature. 10. Horseshoe magnet. 11. Magnet armature. ination. 15. Apparatus for determining the degree of declination. 16. Magnetism of the rium. 20. Map of inclination. 21. Diurnal variation of inclination. 22-24. Magnetometer. to-electric telegraph instruments of Siemens and Halske.

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COMPENSATION (Lat. *compensatio*). The doctrine of C., which the law of Scotland and of most of the other states of Europe have borrowed from the civil law of Rome, corresponds to that of *set-off* in America. It provides that where two parties are mutually debtors and creditors, their debts shall extinguish each other, if equal, and if unequal, leave only a balance due. C. must be pleaded, as it does not operate *ipso jure*, but, when pleaded, it is held to operate from the period of concourse, the interest on either side being stopped from that time.

Compensatio injuriarum is a defense against actions of damages for slander or the like. It is not a bar to action, but a *set-off* or counter-claim. In America, it is not allowed to set-off one trespass or tort against another—a cross-action is requisite; and in Scotland, the leaning recently has been in the same direction.

COMPENSATION BALANCE. See WATCH.

COMPENSATION OF ERRORS, in physics, a method of neutralizing errors which cannot be avoided, by introducing others into the experiment or observation, of an opposite nature, and equal in amount. The compensation pendulum illustrates the principle. See PENDULUM.

COMPETITION (Lat. a seeking together) has been well defined by Dr. Johnson as "the act of endeavoring to gain what another endeavors to gain at the same time." Its most apt exemplification is a race, where all are going to the same point, and all strive to be first there, while though only one can achieve this object, some others will have the satisfaction of being nearer to success than the competitors who are behind them. The most important practical use of the word C. is in the political economy of commerce, where it is the great motive-power of production and enterprise. People work, or embark in trade, avowedly for the purpose of making money. It is the object of the law of the land, as well as of religion and morality, to prevent money-making by immoral means; but within the bounds thus drawn around it, money-making is the object of man's exertion. When the money is made, the next point, always within the same bounds, is to make it go as far as it will. C. works through the co-operation of these motives. The purchaser wants the best article he can get at the lowest price; the producer strives to beat all his fellows, and offer the best article for the price. As sellers come into the market, prices tend to lower from increase of supply. The lower price in turn tends to stimulate demand, and so it goes on until supply and demand are adjusted by the price. The effects of competition upon price can best be traced in foreign exchange and in the wholesale market. In the retail market, custom, personal sentiment or ignorance is apt to restrict its action.

Whatever may be hereafter accomplished, what we chiefly know of the attempts to supersede C. by some other motive to exertion, is, that they have not been successful. We see every day C. increasing the necessaries and comforts of life, and enlarging the wealth of the community. It is said that there are other and better motives which should produce the same effect, but they have not yet been found. It was an object of the ruling party in the French provisional government of 1848 to abolish C., and place all workmen on a par, as some expressed it, or, according to others, to remunerate them, not according to their services, but according to their wants. A great experiment was tried at the hôtel Clichy, where 1500 tailors were employed to make the uniforms for the national guards, the price of which was to be equally divided among the workmen; but even in that climax of enthusiasm, they did not work up to the mark of the lowest paid of the Paris tailors under the competitive system. As each one felt that the value of any extra exertion would be divided among the whole 1500, instead of being enjoyed by himself, his zeal relaxed, and even the thought of "liberty, equality, and fraternity," was insufficient to rouse it. It appears wonderful that large bodies of the French people should have been so easily deceived by statements of which the fallacy, or rather the actual inaccuracy, would be at once seen through by any workingman in this country. Louis Blanc supposes three competitors for a job. A. has a wife and family; he wants three francs of wages. B. has a wife only, 2½ francs will do with him. But C. is a bachelor, who can subsist on 2 francs; therefore, he gets the job, and the others starve. See the second chapter of his *Organisation du Travail*, the title of which is "Competition is for the People a System of Extermination." But he leaves out entirely one side of the bargain. Employers compete to get work as much as workmen compete for employment. If the work of B. and C. be worth, in the market, 3 francs, they will get that whether they have families or not, and it is not the practice of a working-man, any more than of the rest of the human species, to give his work at a third less than its value because he is a bachelor.

Competition may be restrained in various ways. Among the most common checks are custom, combination, personal sentiment, legal restraint, and the immobility of capital and labor. In regard to custom, it is a common thing for a man to deal with a certain shop merely because it has been his practice to do so in the past, and, even though he may obtain the commodity at a lower price elsewhere, he does not avail himself of the opportunity. Personal sentiment which to any extent deters a man from seeking his own economic advantage in the purchase or sale of articles, operates in the same way. For the convenience of the public — especially of travelers — rates of fares are established for cab-drivers, porters, ferrymen, and the like. These men cannot be forced to undertake such functions: they do so because it pays them. Instead of making a separate contract for each job — an arrangement open to fraud and inconvenience —

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they make a general bargain with the public to serve all comers. The rate of remuneration they receive ought to be the closest possible approximation to what C. would fix. Whether it is so or not, can be easily tested. If men do not come forward in sufficient numbers to serve the public, then the fixed rate is too low; on the other hand, if there is a superfluity of hands, a percentage of them being at all times unemployed, it is clear that the rate is too high, and that even partial employment in the line is sufficient to induce men to leave other occupations. Combination, of course, is a direct negation of competition, in that it supplies another motive than the desire to derive immediate gain by selling in the dearest and buying in the cheapest market. For competition to be free and perfect, capital must be ready to flow freely from one channel into another in response to opportunities for economic gain. There are many obstacles in the way of such free movement, for instance, the timidity or inertia of the possessor of capital, the existence of plant which cannot be disposed of at short notice without sacrifice, and lastly the ignorance of opportunities for productive investment. In regard to labor, its immobility is far more marked, as the laborer is more ignorant, more inert, and more bound by custom and association. He cannot wait until the price for his services reaches the figure which he thinks he deserves, and he has not the means of going from one part of the country to another in response to varying demands for labor. The older school of economists held the view that unrestrained competition should be furthered by every possible means and deprecated even such legislation as the Factory Acts. Later economists, while believing in the theory of free competition, recognize that, as society is now organized, temporary checks on industrial warfare are necessary. Trades unions are in principle opposed to competition, but trades unions are justified on the ground that if its members stood alone, they would be in no condition to compete, on fair terms, with employers and capitalists. Prof. Walker has compared the organization of workingmen, under present industrial conditions, to the police enforcement of discipline in dispersing an audience from a burning theatre. Under ordinary conditions the audience would manage to effect an exit more satisfactorily without police compulsion or restraint, but in the time of danger and consequent panic, the operation of individual self-interest cannot safely be left to itself. So, in the present time of industrial conflict, artificial restraints are necessary, though one may contemplate as an ideal the attainment of that degree of human perfection which will render them unnecessary.

C. for public offices — that is to say the appointment to them of those young men who have shown the highest proofs of ability according to certain tests — has so recently been adopted, that there is little opportunity of judging of its effects. But it must be kept in view that this is something quite different from the kind of C. referred to above. Clever men may be secured to the public service by such a test, but it is clear that the motive for these clever men, as well as other public servants, doing their duty, must be something in the shape of promotion or otherwise, which will have a constant influence on them after they are appointed. See CIVIL SERVICE; CIVIL SERVICE REFORM; MONOPOLY; POLITICAL ECONOMY.

COMPIÈGNE, a t. in France, in the department of the Oise, stands on the river Oise, a little below its junction with the Aisne, and 33 m. e.s.e. of Beauvais. A fine stone bridge crosses the river at this point. The town, which is irregularly built, has a tribunal of the first instance, and one of commerce. The inhabitants, numbering (1891) 14,498, are employed in hosiery, rope-making, boat-building, and in traffic in wood and corn. But what best deserves observation at C. is the magnificent palace, built anew by Louis XV., and splendidly fitted up by Napoleon, who often occupied it. It contains a library, a picture-gallery, and other objects worth seeing. The park is extensive, and adjoining the gardens is the beautiful forest of Compiègne, extending over about 30,000 acres. C. is mentioned in the times of Clovis under the name of *Compendium*; and it was the seat of several political assemblies and ecclesiastical councils. It was at the siege of this town, in 1430, that the maid of Orleans was captured; and here, in 1810, Napoleon and Maria Louisa of Austria first met, on occasion of their marriage.

COMPITA'LIA, or LUDI COMPITALIT'II, a festival in Rome in honor of lares compitales, the divinities presiding over places where two or more roads meet. Macrobius says that Tarquinus Superbus restored the festival which had been neglected, and sacrificed boys as a part of the services. Human sacrifices, if ever really made, did not survive the Tarquins, for, after their expulsion, garlic and poppies were offered.

COMPLEMENT is that which completes or makes up a given magnitude to some fixed magnitude It is most commonly used in mathematics, to signify the arc or angle by which a given arc or angle falls short of a quadrant or right angle: thus, the C. of an arc of 60° is one of 30°; and that of 30° is one of 60°.—The arithmetical C. of a number is the number by which it falls short of the next higher number expressible by tens: thus, the arithmetical C. of 64 is $100 - 64 = 36$.

COMPLEMENT, in music, the quantity required to be added to any interval to complete the octave; for example, a fourth is the C. of a fifth, a third is that of a sixth, etc.

COMPLEXION, the color of the skin, existing in the epidermis and dependent upon certain pigment cells. Those nations most exposed to the weather and least under the influence of civilization are usually of the darkest color. The savages of Australia are black; while the half-civilized people of New Zealand are much lighter, the people of

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the Friendly islands are often olive colored, while those of Tahiti, who have attained a good degree of civilization, are of a light complexion, and have long flowing hair. The same conditions are found in civilized countries where degrees of rank are observed; the nobility are easily distinguished by their fair and the peasant by their dark features. Blumenbach divides mankind into five classes, according to color: 1. Caucasian, or white, having for the most part a white skin and red cheeks, and hair soft, long, and wavy, sometimes black, but oftener brown, and frequently yellowish. 2. Mongolian, or olive, having a skin of an olive color, and hair black and stiff, straight, and spare in quantity. 3. Ethiopians, or negro, with black skin, and black kinky hair. 4. American, or red, with copper-colored skin, and black, stiff, and straight hair. 5. Malay, with tawny skin, and black, curly hair. Light hair is the usual accompaniment of white and thin skin; while dark hair and dark complexions commonly go together. There does not appear to be any anatomical difference in the skins of the white and the colored races; the changes are the result of temperature, climate, and exposure.

COM'PLINE. See CANONICAL HOURS.

COMPLUTEN'SIAN POL'YGLOT, the edition of the Scriptures issued under the patronage of cardinal Ximenes at a very great cost to himself. It was in six volumes, printed at Alcala in Spain, between 1502 and 1517. The first four volumes contain the Old Testament, with the Hebrew, Latin, and Greek in three columns, the Targum, and a Latin version of the same. The fifth volume contains the Greek New Testament and the Latin vulgate; and the last volume has the vocabularies and indexes. Only 600 copies were printed. And yet, while this great and learned cardinal was expending a large fortune in producing this most valuable polyglot of the Scriptures, he made a wanton and wicked destruction of a vast amount of most valuable literature. This was in consequence of his fiery zeal for the extirpation of heresy. To effect such extirpation and to preclude the possibility of converts returning to their former errors, he caused all procurable Arabic manuscripts to be piled together and burned, in one of the great squares of the city, so as to exterminate the very characters in which the teachings of the infidels were recorded. But from thousands of manuscripts destined to the fire he did reserve about three hundred, all of which related to medical science. His conduct was in strict keeping with that of the bigoted Spanish conquerors of Mexico, who destroyed every Aztec manuscript, and as far as possible defaced every inscription that fell under their notice.

COMPLUVIUM. See ATRIUM and IMPLUVIUM.

COMPO'NÉ, or GOBONY, in heraldry. When a bordeur, pale, bend, or other ordinary, is made up of two rows of small squares, consisting of alternate metals and colors, it is called componé.

COMPOSITÆ (called by Lindley ASTERACEÆ, and by some botanists SYNANTHERÆ), a natural order of exogenous plants, distinguished by *compound* or *composite flowers*, i.e., heads of flowers which are composed of a greater or smaller number of florets (generally of small size) congregated upon a common receptacle, and surrounded by bracts which form a leafy or scaly involucre, so as to resemble single flowers, which name they ordinarily receive. Another very marked characteristic is, that the anthers of each floret cohere into a cylindrical tube. The order contains both herbaceous plants and shrubs; those which are natives of cold climates being generally herbaceous, and those found in warm regions shrubby, or even arborescent. They have alternate or opposite leaves, without stipules. The florets are either unisexual or hermaphrodite—those of the circumference (or ray) often differing in this respect, as well as in form and color, from those of the center (or disk) of the same head. Bracts (*paleæ*) are often interspersed with the florets upon the receptacle. The calyx is superior, closely adhering to the ovary, and essentially united with it, and afterwards with the fruit, its limb either obsolete or membranous, crowning the ripened fruit, often divided into bristles, hairs, and feathers, which form a PAPPUS (q.v.). The corolla is of one petal, superior, either strap-shaped or tubular, both forms often appearing in different parts (ray and disk) of the same flower (or head), sometimes 2-lipped, very often 5-toothed. The stamens are equal in number to the teeth of the corolla, 4 or 5, and alternate with them. The ovary is 1-celled, with a single erect ovule; the style simple, with 2 stigmas; the fruit dry and not opening (see ACHENIUM); the seed destitute of albumen.—This is the largest of the natural orders of flowering-plants, containing upwards of 1000 genera, and almost 10,000 known species. They are distributed over all parts of the world; but increase in number from the poles to the tropics, and thence, again, diminish towards the equator. In the Linnæan sexual system, they form a distinct class, SYNGENESIA. Jussieu subdivided the order into three sections, and although other subdivisions have been proposed, these are generally recognized as suborders—CYNAROCEPHALÆ, having the florets all tubular; CORYMBIFERÆ, having a disk of tubular florets, surrounded by a ray of strap-shaped florets; and CICHORACEÆ, having all the florets strap-shaped. The *cichoraceæ* abound most in cold, and the *corymbiferæ* in warm climates. The artichoke and thistle are familiar examples of the *cynarocephalæ;* the daisy, aster, dahlia, chrysanthemum, chamomile, and sunflower of the *corymbiferæ;* and the dandelion, chicory, and lettuce of the *cichoraceæ*. By cultiva-

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tion, many of the *corymbiferæ* are changed so that the florets of the disk assume the same appearance with the florets of the ray, as may be seen in the dahlia, chrysanthemum, aster, etc., and they are then said to be double, although the change which they have undergone is very different from that which has taken place in double flowers of other kinds. The C. are not, in general, of very great importance in domestic economy or in the arts, although many of them are among cultivated and useful plants. Only a few, as the artichoke, scorzonera, salsafy, Jerusalem artichoke, endive, and lettuce, are used for food, and these are of inferior importance in that respect. A very few, as safflower and saw-wort, afford dye-stuffs; and a very few, as the Jerusalem artichoke and chicory, are occasionally cultivated for food of domestic animals; the use of chicory-root as a substitute for coffee is well known. From the seeds of some, a bland fixed oil is expressed—the sunflower, madia, and ram-til being the most important. Many are valuable for their medicinal properties, as chamomile, arnica, wormwood and some other species of artemisia, elecampane, tussilago, blessed thistle, etc. Many are characterized by bitterness; stimulating properties are of frequent occurrence; also anodyne, diaphoretic, diuretic, and narcotic properties. Some, as arnica, are very poisonous. A large number are esteemed ornaments of our flower-gardens, particularly in the latter part of summer and in autumn. Amongst these, the dahlia perhaps holds the first place; and others, scarcely less admired, belong to the genera aster and chrysanthemum. The wood of the sirichout (*tarchonanthus camphoratus*), a small tree of the cape of Good Hope, is close-grained, heavy, and very beautiful.

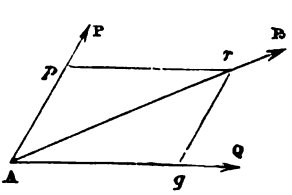
COMPOSITE ORDER, in architecture. See COLUMN.

COMPOSITE SHIPS are built partly of wood and partly of iron, having iron frames with wooden planking, that is, the vessels after being built of iron in the usual way and heavily armored, have been covered all over with planking and copper-sheathed. The object of this is to prevent the ship's bottom from being fouled with weeds and barnacles, which so easily happens in the case of iron vessels. See SHIP-BUILDING.

COMPOSITION, in art, signifies such an arrangement of the separate objects represented as that they shall all manifestly tend to bring out the center thought or idea which animates the whole. Episodes and digressions are less admissible in æsthetic works of art than in poetry, and less in plastic art than in painting. In all works of art, it is to be borne in mind that the story is to be told to, and apprehended by, the eye alone. There is no surer proof of failure in æsthetic C. than when a picture is found to be totally unintelligible, even to intelligent persons, without the aid of a description in a catalogue. Rules are of little or no avail in this matter. There is but one canon of universal application—viz., that the artist should, in the first place, make it clear to his own mind what his work is to express; and that he should then consider by what arrangement of the objects that must, or may, be introduced into the picture, this will be best accomplished.

COMPOSITION, in bankruptcy, a certain sum per pound which creditors agree to receive from a bankrupt in lieu of full payment of his debts, and the acceptance of which operates as a discharge to the bankrupt, and reinvests him in his estate. In Scotland, the acceptance of a C. bill, unless the contrary be stipulated, only entitles the creditors to rank for the C., and not for the full amount, in the event of a second bankruptcy. If no C. bill be accepted, and there be no accession to a C. contract, it has been held that the creditor may, in a second bankruptcy, rank for his full debt. In a Scotch sequestration, the bankrupt must find security for payment of the C. to the satisfaction of a certain proportion in number and value of the creditors, which proportion varies according to circumstances.

COMPOSITION AND RESOLUTION OF FORCES AND MOTIONS. 1. The fundamental problem in statics is to find the magnitude and direction of the *resultant* of two forces; in other words, to compound them into a single force, which shall be in every respect their equivalent. Intensity and direction being the only elements necessary to entirely describe a force, forces in statics are represented by lines, which are obviously capable of being made to represent them both in magnitude and direction. When two forces act along the same straight line on a particle, it is sufficiently obvious that if they act in the same direction, the resultant will be their *algebraical* sum; if in opposite directions, their *algebraical* difference. This being premised, the relation between two forces acting at the same point, but not in the same line, and their resultant, is set forth in the following theorem, which is known as the *parallelogram of forces:* If two forces, P, Q, acting on a particle A, be represented in direction and magnitude by the lines Ap, Aq, then the resultant will be represented in direction and magnitude by the diagonal Ar of the parallelogram described upon Ap, Aq. The proof of this depends upon the simple principles, that a force may be supposed to act at any point of its direction, that point being conceived to be rigidly attached to the particle on which the force acts; and what may be accepted as an axiom of universal experience, that when any number of forces are impressed on a particle or body, each exerts itself, as if the others were not acting, to produce its full effect. See any elementary treatise on mechanics. The doctrine of the parallelogram of forces has



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given rise to much controversy, not as to its truth, but as to its derivation, some appearing to contend that it is directly deducible from the axiom above stated, without the necessity of further reasoning.—Knowing how to compound two forces acting at a point, we are able to compound or determine the resultant of any number. If the forces, though in the same plane, do not act at the same point of a body, those of them whose directions meet may be compounded by the preceding rule; if they are parallel, their resultant is a force parallel to them and equal to their algebraical sum, counting those acting in one direction as positive, and in the opposite direction as negative. For the position of the resultant in this case, see PARALLEL FORCES. The singular case is that of equal parallel forces acting in opposite directions. These constitute a couple, and cannot be represented by any single force. See COUPLES.

2. The resolution of forces is the converse problem. To resolve a given force R, whose direction and magnitude is A*r*, into two forces acting in any directions that may be chosen, as AP, AQ, we have only to draw parallels through *r*, which determine the lines A*p*, A*q*, representing the magnitude of the forces required. It is evident that there is an indefinite number of pairs of forces into which A*r* might be resolved, according to the direction in which the new forces are to act. It is usual, however, to resolve a force into forces that are at right angles to each other.

3. The composition of motions is analogous in every way to that of forces; motions are the results of forces, and the analogy might be expected. If a body be actuated simultaneously by two velocities having different directions, it will evidently move in a direction intermediate to the two, and with a velocity which will in some way depend on each of them, and which is called their resultant. The proposition which sets forth how to find the resultant, is called the *parallelogram of velocities*. It is: If two velocities, with which a particle is simultaneously impressed, be represented in direction and magnitude by two straight lines drawn from the particle, the resultant velocity of the particle will be represented in direction and magnitude by the diagonal of the parallelogram described on those two straight lines. The proof is very simple. There is no reason why the full effect of both velocities should not be produced, as if the body moved first with one of them, and then with the other, in their respective directions. If in one *second* the body moving with the one velocity would reach *p*, and if we suppose it then to move on *pr* for another second, parallel with the other velocity, it would at the end of the second second be at *r*. Hence, under their joint influence, it will be at *r* at the end of one second.

4. The resolution of motions is altogether analogous to that of forces.

COMPOSITOR. See TYPE.

COMPOS MENTIS. See INSANITY.

COMPOSTEL'LA, MILITARY ORDER OF ST. JAMES OF. St. James, the elder, was adopted as the patron saint of Spain, after the victory of Clavijo, and his relics were preserved at Compostella, the capital of the province of Galicia. The marvels supposed to be performed by these relics drew vast numbers of pilgrims, for whose support hospitals were established by the pious canons of St. Eloy. The vicinity of the Moors having subsequently rendered the high roads unsafe, 13 noblemen united for the protection of the pilgrims, and, in conjunction with the canons, resolved to found an order of the same kind as that of the Hospitallers or Templars. The pope granted his assent in a bull, dated 5th July, 1175, accompanied with the statutes of the order. Whatever conquests were made from the infidel were declared the property of the order, and a council of 13 knights was vested with authority to elect and depose a grand master. The knights made vows of poverty, obedience, and celibacy, and professed their belief in the immaculate conception. To protect Christians, and convert infidels, they vowed to be the only object in their wars with the Saracens. In most of the great battles between Christian and Moor, the red cross of the order was conspicuous. The conquests of the order itself, combined with the grateful munificence of the nation, speedily increased its wealth and power beyond those of any of the other orders of knighthood. In addition to the three large commanderies of Leon, Castile, and Montalvan, it possessed nearly 200 minor commanderies, comprising, it is said, more than 200 priories, with many fiefs, cloisters, hospitals, castles, boroughs, two towns, and 178 villages, exclusive of its possessions in Portugal. This enormous wealth and power of the order excited the jealousy of the crown, in which, in 1522, the grand mastership was permanently vested by the pope. Having thus become merely honorary and dependent on the crown, the order rapidly decreased in importance.
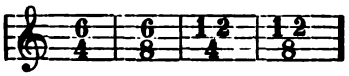
COMPOSTS are a kind of manure (q.v.), consisting of mixtures of substances adapted to the fertilization of the soil, which being allowed to ferment, and undergo chemical changes for a considerable time in heaps, become more valuable than they were at first, or ever could have been if applied separately. C. were formerly made of farm-yard manure, and earth or lime in addition. Road-scrapings, peat-moss, leaves, and clearings of ditches, also formed materials for the purpose. By allowing these to lie in heaps for 6 months, of from 3 to 4 ft. in depth, food was prepared for plants. The mass was usually applied to the turnip crop, and when artificial manures were unknown, considerable benefit arose from such dressings. The use of guano and other light manures has superseded in a great measure the necessity of this laborious process, and C. for the

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turnips or barley crops are now little used. The wonderful effects that have resulted from the application of small doses of nitrogen and phosphoric acid, have impressed farmers in general with the truth, that the most energetic elements bear a small proportion in weight to the whole mass of farm-yard dung or C., and that the mixing of manures in heaps with earth does not so much add to its virtues as to repay the labor expended in the process. More care is now rightly bestowed in preserving manure from washings by rain. C. formed of leaves, ditch-scourings, road-scrapings, or any earthy matter containing a large percentage of vegetable matter, with the addition of lime, may still be used with benefit for pastures that are deteriorating, or where the soil is stiff. Where moss prevails, lime should enter largely as a component. On the other hand, where the soil is of a strong and clayey nature, earthy substances containing vegetable matter in larger proportions should be used. Vegetable matter has the effect of imparting a softness to the surface, that is particularly conducive to the free growth of pastures. Compost made of turf, leaves, earth, and bone-dust is used with great benefit by gardeners for vines and fruit trees which are injured by too concentrated manures.

COMPOUND ANIMALS are those animals, exclusively of the lowest classes, in which individuals distinct as to many of the powers of life, are yet united in some part of their frame, so as to form one living system. Examples of this union are found in many animalcules and zoophytes, also in cestoid worms and ascidian mollusks. The whole living system in all C. A. appears to originate from a single egg or germ, and each is at first simple; the subsequent multiplication of individuals, having distinct organs, but permanently retaining their connection with the system, has some analogies with some of the modes of true reproduction. It is important, also, to observe that many C. A. exhibit very close relations to other animals which in no degree possess this remarkable character. The subject of C. A. is in many respects an extremely interesting one. This occasional peculiarity in animal life may perhaps be regarded as affording some countenance to the theory of Darwin concerning plants, that each bud is to be accounted a distinct individual. But the term individual must be modified in its sense, when applied to the buds of a tree, or the polypes of a polypidom.

COMPOUND COMMON TIME, that species of measure containing the value of two dotted minims in a bar, or two dotted crotchets, marked thus:

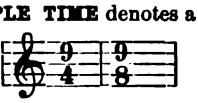


COMPOUND FRACTURE, is such a breaking or contusion, that the air may pass through lacerated flesh and skin to the bone. Such fractures are very difficult to treat with success.

COMPOUNDING OF FELONY, in England, is the offense of taking value for forbearing to prosecute a felony, and is punishable with fine and imprisonment. Compounding of informations upon penal statutes, and compounding of misdemeanors, are also illegal, unless with leave of one of the courts at Westminster, and are punishable in a lighter degree. But in misdemeanors affecting many private (and not public) rights, the court will often permit the defendant to make the prosecutor some pecuniary amends, and thereupon withdraw the prosecution. A species of C. of F. is the advertising a reward for stolen property, coupled with words implying that no questions will be asked, or that no prosecution will be instituted, or that a pawnbroker returning the property will be paid what he has advanced for it; and this offense, by 24 and 25 Vict. c. 96, s. 102, is punishable by a fine of £50, on the advertiser, publisher, and printer. And whosoever shall take money or reward for restoring a stolen dog is liable, by 24 and 25 Vict. c. 96, s. 20, to imprisonment for eighteen months. In the United States, it is treated the same as in England. It is punishable by fine and imprisonment. The accepting of a promissory note signed by a party guilty of larceny, as a consideration for not prosecuting, is enough to constitute the offense; but the mere retaking of stolen goods by the owner is not an offense, unless the thief is not to be prosecuted. A receipt in full of all demands, given in consideration of stopping a criminal prosecution, is void.

COMPOUND INTEREST. See INTEREST.

COMPOUND TRIPLE TIME denotes a measure of nine crotchets or quavers in a bar, and is marked thus:



COMPRESSED-AIR BATH, a large chamber in which patients sit under increased atmospheric pressure for a greater or shorter period. An attempt at this kind of treatment was made as early as 1662, by Dr. Henshaw, but failed owing to the imperfection of the apparatus. The apparatus, as now used, is the invention of M. Emile Laburié, of Paris, who in 1832 conducted a series of careful experiments upon the effects of the atmospheric air at different densities upon the human frame. The bath is a chamber 9 ft. in diameter and 12 ft. high; it is constructed of iron plates riveted together like those of a

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boiler of a steam-engine, so as to be perfectly air-tight; it is provided with two close-fitting iron doors, which can be opened without affecting the pressure of the air within the chamber; the interior is lined with wood, and furnished with seats; a steam-engine of seven-horse power works a pair of large air-pumps, communicating indirectly with the chamber by a pipe that opens by means of numerous small holes in the bottom of the floor, so that the air enters imperceptibly into the chamber; from the roof, a pipe similarly arranged allows the breathed air to escape. Each of these tubes is supplied with a screw valve, by means of which the inlet and exit of the air are regulated. Two barometers hang on the walls of the chamber, to show the rate of increase and decrease of pressure. The pressure is raised at the rate of 1 lb. every 4 minutes, and the lowering takes place at the same rate. The pressure is usually raised to 7 lbs. per sq. inch, in addition to the usual pressure of the atmosphere. The period generally prescribed for remaining in the bath is 2 hours.

The diseases in which the compressed-air bath is said to be most efficient are phthisis, asthma, and chronic bronchitis. The effects are attributed to two causes: 1. A greater quantity of air, and consequently of oxygen, is inhaled in a given time; and not only so, but the amount absorbed is increased in proportion to the pressure of the gas against the walls of the air-vesicles. The increased absorption of oxygen and excretion of carbonic acid enables the lungs to perform their functions more efficiently, and thereby removes any congestion existing in these organs. 2. The increased mechanical pressure of the air upon the mucous membranes, when in a state of chronic congestion, has a bracing effect, and imparts renewed vigor to the entire structure of the lungs and bronchi. At Ben-Rhydding, the compressed-air bath is used in cases of the kind above named, along with the usual appliances of the water-cure.

COMPRESSED-AIR ENGINE. One mode of employing air as a motive-power is described in caloric engine (q.v.). Another obvious way is to compress it, and then apply it in the manner of high-pressure steam. Although compressed air has been used for working small engines in confined situations, such as tunnels (q.v.), it is not at all likely that it will ever come into extensive use, owing to the great waste of power attending it. This waste arises from two causes—first, the friction due to forcing the compressed air along a great length of pipe; and secondly, the loss from the dissipation of the great heat which results from its compression. If, say, 100 cubic feet of air is compressed into 1 cubic foot, it will become very hot, and although it is very easy to keep in the air, it is impossible to keep in the heat. In spite of every precaution, the heat will find its way through the vessel in which the air is confined, and through the pipes in which it is being transmitted, and this is equivalent to a portion of the air itself leaking out, because when the air is permitted to expand in working the engine, it will not attain the bulk it originally had of 100 cubic feet. The greater the original compression of the air, the higher its temperature will rise; and as this caloric, which cannot be kept from escaping, is practically a part of the bulk of the air, it follows that the loss of power from this cause will increase with the pressure or tension of the air. Even were it possible to prevent the escape of the heat, by covering the vessels and pipes with some non-conducting substance, it would not be practicable to use the hot air in the same way as steam is used, because the lubricating material necessary to keep the piston and slide-valves from "tearing" would be decomposed by the high temperature. In steam-engines, there is always a small quantity of water in the cylinders and slide-valves, arising from the condensation of a portion of the steam, and this suffices to lubricate the piston and valves. It is well known that when steam is *superheated* so highly as to prevent a slight condensation in the cylinder and slide-vales, they are very rapidly destroyed. Air rises in temperature when very much compressed, and we cannot use it until its temperature falls; and as this involves a great waste of power, it follows that where economy is of any consequence, air cannot be used as a mode of transmitting mechanical power. Indeed, no fluid can be economically used for transmitting power for any great distance. We have just seen that compressed air is very unsuitable; steam is even more wasteful, because it condenses into water in long pipes. Water itself loses much of its force from friction in passing through long pipes, unless they are of very large size; and in applying it to hydraulic cranes, where the weight to be raised varies, great waste of power arises from the fact, that the cylinder, in which the ram works, has to be filled every time the crane is worked with water at the full pressure of 600 or 700 lbs. to the square inch, even when a pressure one tenth of that amount would suffice to raise the weight. In short, the power actually used in working a hydraulic crane is always the maximum, even when the weight to be raised is a minimum. It *uses* as much power to lift a hundred-weight as it does to lift a ton. The extreme handiness and other practical advantages possessed by the hydraulic cranes leave a large balance in their favor, notwithstanding their waste of power.

In boring the Mont Cenis tunnel (see TUNNEL), air was compressed at the mouth of the tunnel by the abundant water-power easily obtainable there, and forced along to the working face through small iron pipes, for working the boring-machines. The tunnel through the Hoosac mountain in Massachusetts has also been bored by compressed air working the rock-drills. A plan has been proposed for using ordinary steam-boilers and engines close to the working face in the tunnel, and drawing out the smoke and vitiated

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air through a wooden trunk. Another fairly successful application of compressed-air engines has been in the working of coal-cutting machines. Experiments have been recently tried to propel street cars with compressed air. Cylinders are charged with air under a pressure of from 2000 to 2500 pounds per square inch, and are placed upon the car at the charging station. This carries the car a certain distance, at the end of which the air cylinder is replaced by a newly charged one. Engines for the compression of air are used in making ice. See REFRIGERATING MACHINES.

COMPRESSIBILITY is that property of bodies by which they admit of being forced or pressed into less space than they formerly occupied. The particles composing bodies are in all cases at greater or less distances from one another; and whatever brings the particles closer together, diminishes the volume or bulk of the body. This may be effected by various agencies, as, e.g., by the withdrawal of heat (q.v.); but the effect is called compression only when it is caused by mechanical force, as by pressure or percussion. All bodies are compressible, but in different degrees. Many solids, especially those of a compact structure, have this property only in a slight degree. It was believed at one time that liquids were incompressible; more accurate experiments, however, have proved that this is not the case; water, for instance, subjected to a pressure of 15,000 lbs. on the sq.in., loses $\frac{1}{10}$ of its volume. Gases, on the other hand, are strikingly compressible; by means of a common condensing syringe, a number of cubic inches of air can be forced into the space of one inch. Compression is in almost every instance accompanied by an evolution of heat. When a piston, having a piece of German tinder attached to the bottom, is forced rapidly to the bottom of a shut condensing syringe, and rapidly withdrawn, the tinder is found ignited.

In a restricted sense, those gases are said to be compressible which, under great pressure, become liquid. This is the case with carbonic-acid gas, chlorine, sulphurous-acid gas, and others. Atmospheric air and its components have hitherto resisted all attempts to liquefy them; though it is believed that only a sufficient degree of pressure and cold is necessary to make any gas liquid. Carbonic-acid and some other gases are liquefied in small quantities by inclosing the ingredients necessary for generating the gas in a strong glass tube, keeping them separate till the tube is hermetically sealed. The gas, as it is produced, is condensed into a fluid by its own pressure, which is aided by keeping one end of the bent tube in a cooling mixture.

COMPROMISE MEASURES, or OMNIBUS BILL, the popular name of a series of measures submitted to the U. S. senate in Jan., 1850, by Henry Clay, having for their object "an amicable arrangement of all questions in controversy between the free and the slave states growing out of the subject of slavery." These questions, which had perplexed the national government from the beginning, and which, since 1830, had caused a wide agitation among the people, were complicated by the war with Mexico, which led to the acquisition of much new territory, the status of which in respect to slavery remained to be determined. At the north it was insisted that the territory in question was *ipso facto* exempt from slavery, and that it was the right and duty of congress to protect it from the blight of an institution whose nature was at war with republican government The slaves states, on the other hand, were ambitious to establish slavery on at least a part of this territory, and insisted that the national government had no power under the constitution to set up any legislative barriers against the system. The controversy was thought by many to menace the safety of the union, and Henry Clay, on whom had been bestowed the *soubriquet* of "the compromiser" for his previous efforts to stop the agitation of the slavery question, proposed in the senate a series of measures for the purpose of making "a final settlement" of all the questions arising from this subject and bringing the people of the two sections of the country into perfect harmony. When congress met in Dec., 1849, the country was profoundly agitated. President Taylor at an early day transmitted a special message, recommending in substance that California, a part of the newly acquired territory, should be promptly admitted with the anti-slavery constitution which her people had framed and the boundaries which they had designated, and that the other territories should be left under the military government which had been established upon their conquest until such time as they should be entitled to and desirous of admission into the union as states, when they should be received with whatever republican institutions they might present. This plan made no provision for the settlement of the boundary of Texas, which state claimed to include within its rightful jurisdiction most of the people of New Mexico with their entire territory e. of the Rio Grande. To this assumption the people of New Mexico manifested the most determined and active hostility. Mr. Clay at an early day made a speech in the senate concurring in Gen. Taylor's preference that each subject should be considered and decided by itself, but insisting that the territory should be promptly organized under regular territorial government, and the Texas boundary settled. In the progress of the discussion Mr. Clay waived his own preference of separate action upon the several questions, and assented to the combination of the admission of California, the organization of the territories, and the adjustment of the Texas boundary, all in one bill, which thence obtained the nickname of the "omnibus bill." A grand committee of 13 was raised, with Mr. Clay at its head, from which committee the "omnibus" was fully reported. It was contested by a good share of the

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strength and much of the weakness of the senate. When the struggle was at the fiercest Gen. Taylor died, and it was supposed that his decease and the succession of vice-President Fillmore, who was esteemed moderately favorable to the omnibus bill, would secure its passage; but that expectation was not realized. On the contrary, after various amendments had been proposed, and most of them rejected, though some of considerable importance were adopted, a motion to strike out all that part relating to the boundary of Texas was carried, and the bill thus crippled was dismembered limb by limb, until nothing remained but the section organizing Utah as a separate territory. The famous omnibus bill, reduced to this one item, was passed and sent to the house. However, the California admission, the New Mexican territorial and Texas boundary section, and a new statute for the rendition of fugitive slaves, all passed as separate measures. Their effect, however, was not to suppress but rather to intensify the anti-slavery agitation, which waxed hotter and hotter, until it was finally suppressed only by the destruction of slavery itself.

COMPTON, a co. in the province of Quebec, Canada, on the New England border, drained by the St. Francis, Chaudière, and Salmon rivers; pop. '91, 22,779. The Grand Trunk, Canadian Pacific, and Maine Central railroads traverse it. Capital, Cookshire.

COMPTON, HENRY, 1632–1713; bishop of Oxford and afterwards of London. He was the tutor of James II., who, through his teachings, became attached to the Protestant faith. James deposed Compton, but when invasion was threatened he reinstated him; but Compton adhered to the Protestant side, and, when William was proclaimed, crowned him with his own hands.

COMPTROLLER. See CONTROLLER.

COMPULSION. Acts done or grants made under the influence of C.—*i. e.*, either force or fear—are reducible by the law of the U. S. But the fear must be such as would shake a man of ordinary firmness and resolution. In like manner, the plea of *vis major*, —that is, that the individual acted under the influence of power greater than his own— may relevantly be set up as a defense against such offenses as rebellion, piracy, etc. See DURESS.

COMPUTATION OF TIME. See DAY.

COMSTOCK, ANTHONY, b. in Conn., 1844. He attracted notice as an energetic member of the Young Men's Christian Association of New York; was appointed agent of the Soc. for the Suppression of Vice when it was organized in 1873, and has conducted a vigorous crusade against all books, papers, pictures, or establishments tending to corrupt public morals or taint the mind of youth. He published *Frauds Exposed*, etc. (1881) and *Morals vs. Art* (1887). See VICE, SOCIETY FOR THE SUPPRESSION OF.

COMSTOCK, CYRUS BALLOU, a U. S. military officer, b. 1831, graduated from West Point in 1855, served with distinction during the civil war, by the end of which he had risen to the rank of colonel and of brevet brigadier-general. He was afterwards superintendent of the geodetic survey in the northern lakes, president of the Mississippi river commission, and engaged in other important duties. He retired from active service in 1895.

COMSTOCK LODE. This remarkable vein or lode (q. v.) is located in Nevada, about twenty miles east of the boundary of California. Its discovery in 1859, when it received the name "Washoe," from a tribe of Indians, created almost as great an excitement as the first discovery of gold in Cal., and was the immediate cause of the building of Virginia City. Its great productiveness appears from the fact that in one year it yielded more than $23,000,000. From 1890 to 1897 the yield from the Comstock lode was light. Up to 1890 the total amount was $340,016,876.

COMTE, AUGUSTE, the founder of the "Positive philosophy," was b. at Montpellier, France, Jan. 19, 1798. He studied at Paris; and at an early period, it is said, attracted the attention of his companions by the boldness and novelty of his speculations, maintaining that the time was come when philosophy must undergo another great change, such as it had done in the days of Bacon. G. H. Lewes, who regarded C. as the Bacon of the 19th c., only much greater, informs us that C. was but *fourteen* when "the reforming spirit awoke" in him (see *Exposition of the Principles of the Positive Philosophy*, by G. H. Lewes, Bohn, London, 1853). Shortly after this, and while still laboring under the excitement of his new convictions, he became acquainted with St. Simon; entered enthusiastically into his theories, which had not a little in common with his own, and which possessed in addition this advantage, that they were the results of matured thinking (St. Simon being then between 50 and 60); and in 1820, was appointed by the master himself to prepare an exposition of the *Politique Positive* of the St. Simonian society. The work did not satisfy St. Simon, who deplored the absence of the "religious and sentimental aspects" of his system. In 1825, on the death of St. Simon, C. broke off altogether from his *confrères*, and in after-years, was accustomed to speak slightingly of his old master's abilities. In 1826, C. was attacked by a cerebral disorder, brought on by "overwork and heart-anxietics." He recovered, however, and in 1832,

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was appointed professor of mathematics at the *Ecole Polytechnique*, which situation he was forced to resign in 1852, on account of differences with his colleagues. He died at Paris, Sept., 1857.

C.'s works are *Cours de Philosophie Positive* (6 vols., Par. 1830–42; freely translated into English and condensed by Harriet Martineau, 2 vols., 1853); *Traité Elémentaire de Géométrie Analytique* (1843); *Traité d'Astronomie Populaire* (1845); *Discours sur l'Ensemble du Positivisme* (1848); *Système de Politique Positive* (4 vols., 1851–54; Eng. trans., 1875, *et seq.*, Longmans); and *Catéchisme Positiviste, ou Sommaire Exposition de la Religion Universelle* (1 vol., Par. 1852). It is impossible here to do more than state, in the briefest way, C.'s central and governing doctrine. It is this: The race (like the individual) necessarily passes through three intellectual stages—1. The *theological*, in which a supernatural origin is sought for all phenomena, and the *Deus ex machinâ* is the only explanation of events; 2, The *metaphysical*, in which the *sensuously* supernatural is set aside as incredible, and an effort is made to demonstrate the existence of "abstract forces or entities supposed to inhere in various substances, and capable of engendering phenomena;" 3. The *positive*, in which the mind affirms the futility both of theological and metaphysical inquiries, abandons all vain search after the *causes* and *essences* of things, "restricts itself to the observation and classification of phenomena, and to the discovery of the invariable relations of succession and similitude which things bear to each other; in a word, to the discovery of the *laws* of phenomena." This last is the stage at which C. conceives Europe to have arrived. Theology and metaphysics are alleged to be in their dotage, and all the anarchy of modern life to arise from the presence of these disturbing elements. To deliver us from their hurtful influence, C. employs the principles of positivism to organize a new social doctrine, which shall embrace the entire wants of man as an intellectual and emotional being. C. thus aims at being not only the founder of a new philosophy, but also of a new religion, and has even assumed the title of *Fondateur de la Religion de l'Humanité*. His views, which are very original and comprehensive, have excited much attention among thinkers in France, England, and Germany, and obtained not a few ardent adherents. See POSITIVISM.

CO'MUS, in the later mythology of the Greeks, the god of mirth. In classic mythology, the personification does not exist; but in the works of Philostratus, a writer of the 3d c. A.D., C. appears as a winged youth slumbering in a standing attitude, his legs crossed, his countenance flushed with wine, his head (which is sunk upon his breast) crowned with dewy flowers, his left hand feebly grasping a hunting spear, his right an inverted torch. Born from the loves of Bacchus and Circe, C. is "much like his father, but his mother more;" a sorcerer, like her, who gives to travelers a magic draught that changes the human face into the "brutal form of some wild beast," and, hiding from them their own foul disfigurement, makes them forget all the purities of life "to roll with pleasure in a sensual sty."

CON, or COL, an Italian particle, meaning "with," much used in musical terms, as "con spirito," "con brio."

CO'NANT, HANNAH CHAPLIN, 1809–65; daughter of Jeremiah Chaplin, president of Waterville college, and wife of Thomas Jefferson Conant, D.D. In 1838, she was the editor of *The Mother's Journal*, and before and afterwards a contributor to current literature. She was thoroughly versed in the German language, and assisted her husband in translations and other literary work. Her principal work is *The English Bible, a History of the Translation of the Holy Scriptures into the English Tongue*. She wrote, also, *The Earnest Man*, an excellent biography of the missionary Judson.

CO'NANT, THOMAS JEFFERSON, D.D.; b. Vt., 1802; a graduate of Middlebury college in 1823, studied philology in New York, and was professor of languages in Waterville college (now Colby university). He resigned in 1833, to devote his time to the study of eastern languages, and in 1835 he was appointed professor of Biblical literature and criticism in the Baptist theological seminary at Hamilton, N. Y. This position he held for 15 years, two of which were passed in Europe. He translated Gesenius's Hebrew grammar, with the additions of Roediger, a work which became a standard text-book in the United States and England. After holding the professorship of Biblical literature in the university of Rochester for several years, he settled in Brooklyn in 1857, where he died in 1891, devoting himself for a long time to Bible revision for the American Bible Union. His work was chiefly with the books of Job, Matthew, Genesis, Psalms, and Proverbs. He also published (in 1860) a treatise on the term *Baptism* in the New Testament, which attracted much attention. Dr. C. was for a number of years one of the American contingent of the Canterbury (England) committee on the complete revision of the authorized version of the Bible.

CONCAN, a territory in the presidency of Bombay, lies between the Arabian sea and the watershed of the western Ghauts, in lat. 15° 44′ to 20° 22′ n., and long. 72° 52′ to 73° 45′ east. Its length is 330 m., and it varies in breadth from 25 to 50 miles. The more easterly section appears to be a succession of rocky terraces, of apparently volcanic origin. The maritime portion, averaging an elevation of 100 feet above the sea.

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rises here and there to far greater heights, partly in isolated hills, and partly in short ranges. The broad estuaries into which the rivers expand were formerly the retreats of pirates. Of the land that is available for cultivation, the larger part is found on the banks of the rivers—the growth of rice in particular being promoted by annual inundations. The chief peculiarity of the climate is, that the s.w. monsoon, arrested in its career by the lofty barrier on the e., has been known to yield, in one year, a rainfall of nearly 300 inches. To omit the city of Bombay, as not being on the mainland, the principal towns are Junera, Ratnagheriah, Viziadroog, and Vingorla. It was in 1818, on the fall of the peishwa of the Mahrattas, that C. became British territory.

CONCAVE. A surface is said to be C. when lines drawn from point to point in it fall between the surface and the spectator, and convex when the surface comes between him and such lines. The terms, it is obvious, are mere terms of relation. See LENS and MIRROR.

CONCEALMENT, in criminal law. The C. of an offender, after the commission of the crime, with the view of shielding him from justice, is an offense which may be punished arbitrarily; but C., in consequence of an agreement before the crime was committed, involves the concealer in a charge of art and part in the principal crime (Hume, 274, 281).

CONCEALMENT OF PREGNANCY AND BIRTH. See PREGNANCY, CONCEALMENT OF; INFANTICIDE.

CONCEITS, from the Italian *concetti*, and meaning ingenious thoughts or curious and pleasant terms of expression in literary composition. These quaint and often absurd conceits greatly marred the literary work of many writers in the 16th and 17th centuries in Italy and France, and they made some progress in England, as may be seen in Cowley's and Donne's verses.

CONCENTRIC. Circles are C. when they have the same center, but radii of different lengths.

CONCEPCION. The name of several localities in South America, of which the following deserve especial mention: 1. A city near the mouth of the Bio-Bio, the principal river of the republic of Chile, in lat. 36° 50′ s., and long. 73° 5′ west. In 1835, the place was almost destroyed by an earthquake, the cathedral and most of the other public buildings having been thrown down. The city is nevertheless one of the most regular and handsome in the republic. Pop. estimated in 1893 at 30,000. The cathedral and several of the other public buildings are noteworthy. The discovery, in 1852, of coalfields a little to the s. of C., has done much to forward the prosperity of the city. The port of Talcahuano, with which C. is connected by rail, is the safest and best harbor in all Chile, and ranks next to Valparaiso as a mart of foreign trade. Hides and tallow are exported.—2. The bay of the Pacific ocean which forms the harbor of the city above mentioned. It affords good anchorage, communicating with the interior by means of the Bio-Bio, and being sheltered from the open sea by the island of Quiriquino.—3. The province of which the city above mentioned is the capital. Occupying the entire breadth between the Andes and the coast, it is bounded on the s. by aboriginal Araucania, and contains 3535 sq. miles. In 1882, the population amounted to 170,385; in 1894 estimated at 244,841.—4. A town in Paraguay, capital of the department of C., situated on the Paraguay river and having a pop. (est. 1895) of 11,000.—5. C. del Uruguay, sometimes called simply Uruguay, a city in the province of Entre Rios, Argentine Republic, on the river Uruguay. It has a considerable trade in the products of the surrounding district, and contains salt works. A railway connects it with Paraná. Its pop. is estimated at 10,000.

CONCEPTION, in psychology. See IDEA.

CONCEPTION, IMMACULATE. See IMMACULATE CONCEPTION.

CONCEPTION OF OUR LADY, an order of nuns, founded in 1484, in honor of the immaculate conception, by Beatrix de Sylva, sister of James, first count of Poralegro, in Portugal. It was confirmed in 1489 by pope Innocent VIII., who granted the sisterhood permission to follow the rule of the Cistercians; but after the death of the foundress in 1489, cardinal Ximenes put the nuns under the direction of the Franciscans, and imposed on them the rule of St. Clara. The order subsequently spread into Italy and France. Besides the grand office of the Franciscans, the nuns recite on Sundays and holidays a lesser office, called the Office of the Conception of the Holy Virgin. Their dress consists of a white gown, a blue mantle, and a scapulary, on which is worn the image of the Virgin.

CONCEPTUALISM, the name given to a philosophical theory which is, in some sense, intermediate between "realism" and "nominalism." Realists assert that the general notions of the mind are the substance of things; that "ideas" answer not only to the reality of objects, but contain their soul and life. Nominalists maintain that general notions are mere abstractions, inventions of the brain, not expressing the real substance of things. Conceptualists, striving to find a position between the two, teach that the mind has the power of forming for itself general conceptions of single objects. Aris

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totle taught that, although we cannot prove the correspondence of general conceptions with the reality, we are always compelled to take them for indispensable forms of thinking, if we will think at all. Consequently, some have been unable to satisfy themselves whether they were realists, nominalists, or conceptualists. See IDEA.

CONCERT, a musical entertainment of concerted pieces, symphonies, etc., sometimes interspersed with songs, performed by an orchestra of many instruments. C. performances are now established in almost every city in Europe, and societies are formed to foster and encourage the art. Among the oldest institutions of this kind are the Gewandhaus concerts in Leipsic, established in 1742; and the concerts spirituels in Paris, established in 1725. Of more recent institution are the concerts of the Philharmonic society in London, of the Conservatoire in Paris, and the Symphonic concerts in Berlin, etc.

CONCERTANTE, an Italian word to describe an orchestral composition in which various instruments have prominent solo parts to display the capacity of the instrument and technique of the performer.

CONCERTI'NA, a musical instrument of modern invention, the sounds of which are produced by free vibrating springs of metal, as in the accordion. The scale of the C. is very complete and extensive, beginning with the lowest note of the violin, G, and ascending chromatically for three and a half octaves to C. Violin music can be performed on the C. with good effect. Every sound in the scale is double, and can be produced either by pulling the bellows open, or by pressing them together. Wheatstone of London is the inventor. Concertinas are now made in France and Germany, but not so perfectly as in England.

CONCER'TO, a musical composition for a solo instrument, with orchestral accompaniments, calculated to give the performer an opportunity to display the highest mechanical skill, as well as intellectual cultivation in the art. The C. consists of three movements, each of which, like the whole, has a certain character, and like the symphony or the sonata, requires a clear development and treatment of the motives, and a strict adherence to the rules of form. When the form is in any way abridged, it is then called a concertino. From the beginning of the last century to the present time, the pianoforte and the violin are the solo instruments mostly used for the concerto. The oldest violin concertos are those by Tartini and his scholars. The French and Germans afterwards improved on these, and fixed the forms, which all the great masters of modern times have adhered to. Innumerable concertos have been written for the pianoforte, amongst which compositions of the most masterly kind are to be found. Concertos for wind instruments have been less regarded, and are generally written by the performers themselves, and seldom deserve to be called classical works.

CONCERT PITCH. See PITCH.

CONCETTI. See CONCEITS.

CONCH, the name of many univalve shells, which are sometimes used as dinner horns, having almost the sonorous quality of a trumpet. In some of the Pacific islands the shell is used as a musical instrument. The heaps found in various places on the Atlantic coast of the United States indicate that the Indians used for food the tough clam-like creature enclosed in the shell.

CON'CHA, MANUEL DE LA, Marquis of Douro, 1808–74; brother of José. He served against Napoleon, against the South American revolutionists, and against Don Carlos, and supported Maria Christina, Isabella, and the administrations of Espartero and Narvaez. He escorted Maria Christina to Paris, and was afterwards one of the prominent ultra-conservatives in the Spanish legislature. His work on infantry and cavalry tactics is a text-book in Spain. He was killed at the battle of Muro, Spain, while fighting against the Carlists.

CONCHIF'ERA (Lat. shell-bearing), in Lamarck's arrangement of mollusks, a class containing those which have bivalve shells; *lamellibranchiata* (q.v.) and *brachiopoda* (q.v.). The term is still sometimes used.

CON'CHO, a co. in w. Texas, on the Colorado, intersected by the Concho river and other streams; 1010 sq.m. It has a broken and rocky surface, with little timber. Pop. '90, 1059, with colored. Co. seat, Paint Rock.

CON'CHOID OF NICOME'DES, a curve invented by Nicomedes, with the view of trisecting an angle, of constructing two geometrical means between two given straight lines, and of "doubling the cube." It is generated as follows: Draw a straight line which will be the directrix of the curve, take any point without the directrix as the pole, and draw a number of straight lines from it intersecting the directrix. Lay off distances on the intersecting lines each side of the directrix equal to a given line (the modulus): the curve traced through the points above the directrix will form the first or superior conchoid, and the curve traced below will form the second or inferior conchoid. Both branches are infinite in extent, and the directrix is a common asymptote. If the foot of the perpendicular dropped from the pole to the directrix be taken as the origin, and this distance be called b, and the modulus a, the equation to the C. is $x^2 = \frac{(b+y)^2(a^2-y^2)}{y^2}$. The curve

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may easily be described mechanically, and is frequently used in architecture as a bounding line of the vertical section of columns. The name is Greek, and means shell-shaped.

CONCHOL'OGY (Gr. *konchos*, a shell, *logos*, a discourse), the science which treats of shells and of the animals inhabiting them. C., as a science, is at least as old as the days of Aristotle; the study of it was resumed along with that of the other sciences, when the dark ages had passed away; but since the beginning of the present century, it has given place to a more extended and comprehensive study of molluscous animals, now sometimes designated MALACOLOGY; the presence or absence of a shell having been found not to constitute one of the most important characters which distinguish different classes of mollusks. C., indeed, was only the form of the science suited to a time when the shell was more considered than its inhabitant. Yet the relations between shells and the mollusks which possess them are such, that the labors of the merest conchologists have contributed to the real advancement of science, both zoological and geological. It is upon the knowledge of these relations that many of the conclusions of the geologists are founded. In systems of C., shells were usually divided into three orders, *univalves*, *bivalves*, and *multivalves*, according to the number of pieces—one, two, or more—of which they are composed. The first two were established by Aristotle, the third was added in modern times.

CON'CHOS, or CONCHAS, a river in Mexico in the state of Chihuahua, flowing through the rich table land of that region and joining the Rio Grande del Norte, after a course of about 350 miles.

CONCIERGE is the French name for the door-keeper or janitor of a house, hotel, or public building. In French towns, where a large portion of the population lives in flats, the common door by which many households have access to their several apartments is very usually under the charge of a concierge, who exercises a general supervision over all who pass his *conciergerie*. The ancient Paris prison, known as the Conciergerie, is still standing, though Marie Antoinette's cell, converted in 1816 into a chapel, was destroyed by the communists in 1871.

CONCLAMA'TIO, a custom among the ancient Romans something like the "wake" among modern Irish. When Dido burned herself to death, her palace was vocal with the howls of her attendants. Their ululations apparently resembled the wild lament of the Irish over their dead.

CONCLAVE (Lat.), either the place where the cardinals assemble for the choice of a pope, or the assembly itself. The practice of a C. originated at the election of Gregory X. at Viterbo in 1271, and was regulated by the council of Lyons in 1274, with formalities still substantially in force. The C. must consist of a single apartment, having only one door, which is kept securely locked. Food and other necessaries are handed through a window, and are subjected to a rigorous examination, in order to prevent communication with the outer world; the cardinals not being allowed to leave the place, or to receive or send out letters, until a new pope is chosen. As the C. was generally held in the Pauline chapel at Rome, a number of little cells were erected in one of the galleries, each to form the lodgment of a cardinal.

A *conclavist* is a spiritual or secular attendant on the cardinals during the conclave. Each cardinal is allowed three. They are sworn to silence, and are not allowed to leave, except in dangerous illness. This office is of great delicacy and trust; and formerly a sum of 10,000 crowns was divided among the conclavists at each election.

CONCOMITANCE, SACRAMENTAL, in the Roman Catholic church, implies that the body and blood of Christ, sacramentally, accompany each other, so that under either form, whether wine or bread, both are sacramentally received.

CONCORD, by English writers on music, is defined as the relation, harmony, or agreement between two or more consonant sounds; such as the union of the major or minor third with the perfect fifth and octave. The German musical technology gives a wider meaning to this term, defining C. as every simultaneous sounding of tones, whether in single intervals or in complete chords, and whether consonant or dissonant.

CONCORD, a town in Middlesex co., Mass., on the Concord river and the Fitchburg railroad, 19 miles w. of Boston; pop. '90, 4427. It is a very handsome town, in a lovely rural region, having a variety of manufactories. It was in Concord that the provincial congress met in 1774–75, and here, April 19, 1775, a number of men were killed in a skirmish between the people and the English troops. Ralph Waldo Emerson, A. Bronson Alcott, Hawthorne, Thoreau, and other men of literary fame, were residents of the town, which gained a wide repute as one of the centers of philosophic thought. It was incorporated in 1635, and contains the State reformatory, public library, high school, and banks.

CONCORD, a city, capital of New Hampshire and co. seat of Merrimack co., on Merrimack river, 75 m. n.n.w. of Boston. The river divides the city almost equally from n. to s., and along a part of the n. border winds the Contocook river. At the junction of the two streams there is an island famous as the place where, in 1698, Mrs. Hannah Dustin, aided by a boy and her nurse, slew ten Indians who had made them captives at Haverhill, Mass. The site of Concord was the seat of the Pennacook Indians. Concord, settled in 1725, was called Rumford from 1730 to 1765, was incorporated 1853,

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is well laid out, and the streets are finely shaded with maples and elms. Several railroads center here, connecting with all points in New England and Canada. In 1810 the pop. was 2398; in 1890 it was 17,004. Among the principal buildings are the state-house, built of granite by the labor of state-prison convicts, U. S. government building, court-house and city-hall, state prison, and the state asylum for the insane, with which is connected a fine farm. The city is supplied with water from works built in 1872. Not far away are extensive quarries of fine-grained white granite, of which large quantities are sent to other cities. There is an abundance of water-power, furnished by the rivers and small streams near the city. The manufactures include carriages, foundry and machine works, harness, furniture, flour, woolen and cotton goods, leather, pianos, shoes, belting and leather hose, etc. The libraries and schools of the city, including St. Paul's school for boys, are ample and of the most advanced order. The State house park contains a bronze statue of Daniel Webster.

CONCOR'DANCE, a book arranged in alphabetical order, and showing in how many passages all, or at least all the more important words in any work occur. For writings of universal import, from which passages are continually being adduced to prove or support principles affecting our daily life and action, such a hand-book is indispensable. The necessity of a C. for the Bible seems to have been felt at an early period. The first was executed by Antonius of Padua (b. 1195, d. 1231), who published it under the title *Concordantiæ Morales.* He was followed by Hugo de St. Caro (1244) and others, all of whom based their labors on the Latin Vulgate. A Greek C. by Euthalios of Rhodes was prepared about the year 1300, but has been lost. The Alexandrine C. of the Old Testament was compiled by Conrad Kircher in the 16th c., and Xistus Vetuleius published in 1546 a C. of the Greek New Testament, which was republished and amended by Stephens in 1600. In Hebrew, a C. was drawn up by rabbi Isaac Nathan, in 1438, amended by Marius of Calassio (Rome, 1620), by John Buxtorf (1632), and by Fürst (Leip. 1837–41). The chief concordances for Luther's translation of the Bible are those of Lankisch, Büchner, Wichmann, and Schott. For the authorized English version of the Bible, the best was Alexander Cruden's (1737); now surpassed by Dr. Robert Young's (1879). Among the best editions of Cruden's C. we may mention those bearing the dates 1810 and 1824. The C. of Parallels, by Crutwell (1790), is esteemed a valuable work. Among secular works of this kind, the *Complete Concordance to Shakespeare,* compiled by Mrs. Cowden Clarke (Lond., 1845), is one of the most remarkable.

CONCOR'DAT (Lat., *concordatum,* "a thing agreed on"), although sometimes used of purely secular treaties, is now almost exclusively employed to designate a compact on ecclesiastical affairs between the pope, as head of the Roman Catholic church, and the temporal ruler of a particular kingdom or state. Concordats commonly relate to things which are neither purely spiritual, as faith, the sacraments, or worship, nor purely temporal, as civil rights, taxation, etc., but mixed matters, regarding which each power makes certain claims, in regard of which the action of the two powers can with difficulty be dissociated; and in which, therefore, in the hope of harmonious co-operation for the public good, each is willing to cede to the other a portion of its peculiar right. Concordats are of two kinds—the first in the form of a treaty, to which both the contracting powers are formally consenting parties; the second, in which the terms are concerted by both, or, at least, are mutually accepted, but are published only by one, most commonly by the pope, in the form of a bull, reciting the enactments which result from the agreement. This difference is only in form. In both it is a settled doctrine of Roman Catholic canonists, and especially of those of the Ultramontane (q.v.) school, that the pope never absolutely cedes purely spiritual powers. Thus, in the presentation to bishoprics, while the king "nominated" or "elected," the pope always reserved to himself the power of "canonical institution."

We shall briefly enumerate the most important concordats. (1.) *Concordats with Germany.*—The earliest subject of negotiation between church and state in Germany was the mode of electing the popes, to which subject may be referred the compact of Otho I. with John XII., and the constitution of Leo. VIII.; but the well-known concordat of Worms in 1122, regarding investitures, is commonly regarded as the first concordat strictly so called. Similar agreements took place on the question of the *Regalia* (q.v.), between the Roman see and the emperors Otho IV., Frederic II., and Rudolph of Hapsburg. A more comprehensive compact on church matters is that of which the foundation was laid at Constance in 1418, and which was subsequently modified, by the "Frankfort" or "Princes' Concordat," by the concordat of Aschaffenburg, and by that of Vienna; which last, although practically disregarded by Joseph II. and Leopold, continued in use till the suppression of the emperor of Germany in 1803. Its place was supplied, under Pius VII. and his immediate successors, by separate concordats with Bavaria, 1817; Prussia, 1821; Baden, Würtemberg, and other minor states, 1818; Hanover, 1824; Saxony, 1827; and the Netherlands in the same year. The last German concordat was that concluded at Vienna, Aug. 18, 1855. The chief articles were that the pope should have direct communication with the bishops, clergy, and people, and archbishops and bishops with their clergy and their flocks, and the right to govern their sees according to the canonical law. Education was placed entirely under the control of the church. The bishops were to settle what books should be used. The chief inspector of schools was to be chosen by the emperor from among the individuals

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selected by the bishops. The government bound itself to prevent the dissemination of books pointed out as dangerous to religion by the bishops or archbishops. All questions of marriage, except in so far as they might involve civil consequences, were reserved exclusively to the ecclesiastical courts. Priests guilty of crimes were to be tried in the temporal courts; but the bishop was to be duly notified of the fact, and convicted priests were to be imprisoned apart in a monastery or other ecclesiastical building. The emperor was to choose bishops, but with the advice of the existing bishops and archbishops. The church might acquire new property, but once acquired, it could not be sold or mortgaged without the consent of both pope and emperor. This concordat was set aside in 1868 in all the dominions of the emperor of Austria. (2.) *With France.*—The pragmatic sanction, ascribed to St. Louis, but really of later date, has some of the characteristics of a concordat; but the first proper concordat is that of Francis I. with Leo X. in 1515 and 1516, which continued in force, although with more than one conflict of the two powers, till the revolution. In re-establishing the church in France, Napoleon Bonaparte, as first consul, concluded with Pius VII., through the agency of cardinal Consalvi, the celebrated concordat of 1801; which he afterwards compelled the pope, then a captive at Fontainebleau, to modify by a new act in 1814. Both were ignored at the restoration; but an attempt to produce a substitute in 1817, and again in 1819, led to no practical change. (3.) *With Italy.*—In Italy, an agreement regulating the election of bishops was concluded with Nice and Savoy by Nicholas V. in 1451; and a formal concordat was made with Sardinia by Benedict XIV. in 1740. The ecclesiastical affairs of Naples were anciently regulated by the terms of what was called the *Monarchia Sicula;* but a formal concordat was concluded with Charles III. by the same pope in 1741, and a new concordat was made by Pius VII. in 1818. (4.) *With Spain.*—Charles V. concluded a concordat for his Spanish kingdom with Adrian VI. and Clement VII.; and a further concordat was made by Clement XII. and Philip V. in 1737. (5.) *With Portugal.*—Benedict XIV. made a concordat with Portugal in 1741.

CONCORD, Book of, a collection of confessions of faith published in 1580, generally accepted by the Lutheran church. Its contents are: 1. The Apostles', the Nicene, and the Anthanasian Creeds; 2. The Augsburg Confession; 3. The Apology of the Confession; 4. The Schmalcald Articles; 5. The Larger and Smaller Catechisms of Luther; 6. The Formula of Concord. The last named division, the Formula of Concord, appeared in 1580, after protracted conferences, and was acceded to by 86 of the states of the empire. Its topics are: The Rule of Faith and the Creed; Original Sin; Free Will; Justification; Good Works; The Law and the Gospel; The Third Use of the Law; The Lord's Supper; The Person of Christ; The Descent of Christ into Hell; The Customs of the Church; Predestination, and Election; and an appendix concerning heresies and sectaries.

CONCORDIA, a parish in e. Louisiana, on the Mississippi and Red rivers; 680 sq.m.; pop. '90, 14,871, includes colored. The surface is low, and much of the land is subject to inundation. Cotton is the chief production. Seat of justice, Vidalia.

CONCORDIA, a Roman divinity, the goddess of concord, in whose honor many temples were built, the oldest of them by Camillus in 367 B.C. In this temple the senate sometimes met. It was restored by Livia, wife of Augustus, and consecrated to Tiberius in 9 A.D. It was burned in Constantine's time, but was again restored. The goddess was represented as a matron, holding in her right hand a saucer-like vessel or an olive branch, and in her left, the horn of plenty. Her symbols were two hands clasped together, and two serpents entwined about a wand.

CONCRETE (Lat. *concrescere*, to grow together) is opposed to abstract (see Abstraction). A concrete notion is the notion of an object as it exists in nature, invested with all its qualities, as any particular flower, leaf, or tree; an abstract notion is the notion of any attribute of that flower, leaf, or tree, such as its color, form, or height; qualities which may be thought of independently of the objects in which they inhere, though they cannot so exist. The abstract method of handling a subject is adapted to speculation and reasoning; the C., to poetic effect and impressive illustration.

CONCRETE, a mixture of hydraulic or other mortar with gravel or shingle, which, on hardening, forms an artificial conglomerate. The best C. is made by well mixing hydraulic mortar (see Cement) with sand and sufficient water for complete hydration, and then adding the shingle or screened ballast, and mixing them well together. An inferior C. may be made by laying the shingle into the foundation or other place where the C. is required, and then pouring mortar upon it, to fill the interstices between the pebbles.

The principal use of C. is to form a basis of artificial stone for buildings that rest upon loose or damp subsoils. Such a basis, if well made, forms a solid foundation-slab upon which the weight of the whole structure is equally distributed. It also resists the capillary ascent of moisture from the soil, which would otherwise take place through brick-work or porous stone. A very extensive and important application of C. in this manner has been made in the lower part of Pimlico and Thames bank. An extensive district that, only a few years since, was a pestiferous marsh, is now covered with high-class houses, and forms one of the fashionable quarters of the w. end of London. The houses, and, in fact, the streets altogether, may be said to rest upon a substratum of

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artificial rock formed of C., which, besides giving stability to the buildings, shuts out the exhalations from the soil, and prevents the ascent of the moisture so abundant below.

C. is occasionally used for building walls by ramming it into molds, giving it the form desired. A very beautiful application of C. for making mosaic floors is common in Italy. A stratum of cement is laid, and the surface carefully leveled; then pebbles of variegated colors are sifted over it; before it is quite hardened, these are beaten down, so as to be imbedded in the cement, and form the top layer. When the C. has completely hardened, the rounded surfaces of the pebbles are ground down by means of a large slab of stone, which, together with sharp sand, is rubbed over the surface until it is quite smooth.

CONCRETE TERM, A, is one used when the notion of a quality is regarded in conjunction with the object that furnished the notion, as *wise*. The quality regarded in itself, independently of the object with which it is connected, is called an *abstract term*, as *wisdom*. To use the words of J. Stuart Mill, a concrete term is the name of a thing, an abstract term is the name of a quality, attribute, or circumstance of a thing. Thus, *red house* is the name of a physically existing thing and is a concrete term; *redness* is the name of one quality of the house and is abstract. Again, while *wise* and *red* express qualities, they at the same time express or imply or refer to some subject of which the terms wise and red may be predicated. Adjectives therefore are concrete, not abstract. If we say that a book is useful, it is to the book we apply the adjective *useful*, and *usefulness* is the abstract noun which denotes the quality. So, *equal*, *grateful*, *reverent*, are names of *things*, and the corresponding abstract terms are *equality*, *gratitude*, and *reverence*.

CONCRE'TION, in medicine, a formation of solid unorganized masses within the body, either by chemical precipitation from the fluids, or by the accidental aggregation of solids introduced into the system from without. In the former case, a C. is termed a calculus (q.v.); in the latter, the C. may be either wholly composed of solids foreign to the body, or these may be mingled with the elements of the secretions, as with mucus, or calculous matter. Thus beans, peas, needles, etc., introduced into the cavities of the body, have become the nuclei of concretions, by attracting around them mucus, or crystalline deposits from the urine. The most remarkable forms of C., however, are perhaps those formed in the stomach and intestines of man and the lower animals, from the more solid and indigestible parts of the food, or of substances improperly swallowed. Thus, young women have been known to acquire the habit of swallowing their own hair to a great extent; and very large concretions have been thus formed, which have proved fatal, by obstructing the passage of food. The use of oatmeal in large amount has also been found to lead to concretions, especially when eaten coarsely ground and unboiled; such concretions have commonly been found in the intestines. The excessive domestic use of magnesia in the solid form as a laxative, has been known to have a similar effect. In certain animals, intestinal concretions are not uncommon, and grow to an immense size; they used to be greatly prized as antidotes, and were used in medicine under the name of bezoars (q.v.). In certain forms of morbid deposits, such as fibrous tumors (see TUMOR), and in tubercle (q.v.), concretions not unfrequently form; they are for the most part composed of phosphate of lime.

CONCRE'TIONARY STRUCTURE is a condition in rocks produced by molecular aggregation subsequent to the deposition of the strata, whereby the material of the rock is formed into spherules or balls, as in the grains of oolitic limestone, or the larger concretions of magnesian limestone.

CONCUBINAGE. The earliest Roman laws were distinguished for the strictness with which they treated marriage. They not only upheld thoroughly the principle of monogamy, but they fettered marriage itself with many burdensome forms. Hence arose the practice of a free unmarried man entering into a less strict relation with a single woman—a sort of permanent cohabitation. The offspring of such a connection, called natural children, had not the rights of legitimate children, but they were recognized by the father. Augustus, with a view to promote regular marriages and check the growing licentiousness, enacted a comprehensive marriage-law (*Lex Julia et Papia Poppæa*), which still allowed C., but only with women of low rank or who had lost their station. Christianity required the complete sanctity of marriage, although the civil law long continued to tolerate separation at pleasure. In the eastern empire, C. was entirely prohibited by the emperor Leo. The ancient laws of the Germans recognized, along with regular marriage, an informal connection of the sexes. In the middle ages, a similar connection became customary, called a "left-handed," or morganatic marriage (q.v.). The code Napoleon does not allow of C., but the wife can sue for separation only when the husband maintains a mistress in the common dwelling.

CONCURRENT JURISDICTION, exists where two or more courts possess the equal and co-ordinate right of taking cognizance of a single cause. Thus in the United States a justice court and a city court may often take cognizance of the same matter; or a court of common pleas and a superior court may do the same. In criminal cases it is an established rule that when one court has brought an offender before it, the court having con-

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current jurisdiction is thereby debarred from taking cognizance of the case. In civil trials it is the privilege of the person appealing to the law—that is, in most cases, the plaintiff—to choose which of the two co-ordinate courts he wishes to bring the matter before. The phrase concurrent jurisdiction is used in opposition to *privative* jurisdiction, i.e., where one court only has the right of hearing and determining the matter at issue.

CONCUSSION, in medicine, a sudden impression or shock communicated to the brain or to the whole nervous system, as the result of a severe injury, or collision of the body with some external object, as in a fall, or in the crash of a railway accident. It is usual to distinguish C. from the more mechanical results of injury, by observing its effect upon the circulation and on the general sensibility; and there can be no doubt that the distinction is well-founded, for in the first place death may follow from C. alone, without any appreciable destruction of texture; and 2dly, C. may be followed by recovery within a few hours, leaving the local injury entirely unattended by constitutional disturbance; or recovery may be complete, there having been no local injury at all. Under the immediate shock of injury, the patient is usually unconscious and insensible, pale, cold, sometimes shivering, pulseless, or nearly so, the pupils inclining to contraction rather than dilatation, or in some cases natural; the breathing is irregular, slow, feeble, and sighing; the secretions are suspended; the stomach often yields up its contents; and the bowels and bladder may also be evacuated. This state ends either in death, or in gradual reaction, which may pass over into a state of inflammatory fever, with violently excited circulation, and greatly increased heat of the surface. In the treatment of C., it is sometimes necessary to have recourse to stimulants; but in general, moderate heat applied to the surface, abundant supplies of fresh air, and careful adjustment of the injured parts, are all that is necessary till consciousness is somewhat restored, and the power of swallowing regained; some warm soup should then be given, with a small allowance of wine or other stimulant, proportioned to the age and habits of the individual; and the effect being carefully watched, this treatment may be continued until restoration is complete. If there be danger of failure of the breathing or heart's action, artificial respiration (see RESPIRATION) should be employed without delay; and the patient should be transferred as soon as possible from the place of the accident to a warm and comfortable bed, where the necessary restoratives may be more conveniently used. The connection of the nervous system with the heart, in cases of C., is a very curious subject in physiology, and has been the subject of minute investigations by Bichat, Legallois, Wilson Philip, Marshall Hall, and many others. See SHOCK.

CONCUSSION FUSE. See FUSE.

CONCUSSION SHELL. See SHELLS.

CONDAMINE, CHARLES MARIE DE LA. See LA CONDAMINE.

CONDÉ, the name of several places in France, the following being the most important:

CONDÉ, in the department of Nord, situated at the confluence of the Haine and Scheldt, about 8 m. n.n.e. of Valenciennes. It has an arsenal and strong fortifications, constructed by Vauban, and was the scene of severe contests in the Napoleonic wars. Here are coal-pits and a great coal depot; and manufactures of starch, chicory, leather, and soap. Pop. 1891, 4772.—CONDÉ-SUR-NOIREAU, a t. in the department of Calvados, at the union of the Durance and the Noireau, 25 m. s.s.w. of Caen. It is an old place, with dark heavy houses. Its manufactures are cotton, cutlery, and leather; and it has a pretty extensive trade in cattle, honey, etc. Pop. '91, 6764.

CONDÉ, a family celebrated in French history, and which takes its name from the town of Condé (q.v.), in the department of Nord. One Godfrey de C., about the year 1200, was in possession of a part of the barony of Condé. His great-granddaughter, Jeanne of C., married in 1335 Jacques de Bourbon, comte de la Marche, and the barony of C. went to their second son, Louis de Bourbon, comte de Vendôme, whose great-grandson, Louis de Bourbon, prince of C., in virtue of his blood-relationship to the royal family, assumed the title of prince, and is regarded as the founder of the new house of this name.

CONDÉ, HENRI I. DE BOURBON, Prince de, 1552–88; son of Louis. He joined the Huguenots after the death of his father, and escaped death at the massacre of St. Bartholomew only on a promise to renounce Protestantism. Some time afterwards he collected a military force and joined Alençon, the Protestant leader. In 1585, he was excommunicated by the pope. He died from poison, and his wife was suspected of being guilty of his death; but Henry IV. refused to prosecute her, and that led to the suspicion that she had a *liaison* with that monarch.

CONDÉ, LOUIS DE BOURBON, Prince de, was b. 7th May, 1530, and first distinguished himself under marshal Brissac. In the dissensions between the houses of Guise and Bourbon, C. was the soul of his party, which was for the most part Calvinistic or Huguenot. It was he who directed the conspiracy of Amboise, which had for its aim the banishment of the Guises, and the capture of Francis II. On its discovery, he fled to his brother at Nérac, and there projected a plan for securing possession of all the large towns of France, which, however, miscarried, and C. himself was taken prisoner,

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and condemned to be executed; from which fate he was luckily saved by the opportune death of the king. On the accession of Charles IX. to the throne, C. obtained his liberty and the governorship of Picardy; but the harsh treatment which the Huguenots in general received, drove him into rebellion; and on the 11th of April, 1562, he commenced a civil war by the capture of Orleans, Rouen, and other places. Defeated and taken prisoner at the battle of Dreux, in the same year, he was employed by the victors in concluding a treaty of peace, which lasted only a short time. C. recommenced hostilities by a daring but unsuccessful attempt to possess himself of the person of his sovereign (28th Sept., 1567). After the battle of St. Denis, 10th Nov., 1567, a second peace was concluded; but having reason to believe that Catharine de' Medici was plotting against his liberty, he once more renewed the war against the Catholic party, in the beginning of 1569, and was again defeated and taken prisoner at the battle of Jarnac, 13th Mar. of the same year. While his wounds were being dressed on the field, a captain of the Swiss guard, named Montesquieu, approached, and shot him through the head. C. was of a joyous and amorous disposition. His gallantries were far from being in accordance with the austere character of the religion he professed, and it cannot be doubted that the feeling of political rivalry to the house of Lorraine, which animated the Bourbon family, explains the career of C. quite as much as his religious convictions.

CONDÉ, Louis II. of Bourbon, Prince of, commonly termed "the great Condé," was the great-grandson of the preceding, and was b. Sept. 8, 1621. In youth (1640–42), he took part in the sieges of Arras and Perpignan, and commanded the army against the Spaniards in the Netherlands, where he almost extirpated the foe in the battle of Rocroi, May 19, 1643. In the autumn of the same year, he was sent to Alsace to support Turenne; and in the engagements of Aug. 3 and 5, 1644, he defeated the Bavarian gen. Mercy near Freiburg, and so won for France a considerable portion of Germany. By the death of his father, 1646, C. became the head of his family, and, next to the duke of Orleans, was the highest personage in the state. This pre-eminence excited the envy of cardinal Mazarin, who, however, in 1648, intrusted C. with the command of the army in the Netherlands. Here the prince captured Ypres, and gained the battle of Lens, but was called back to Paris by the war of the Fronde (q.v.), which had just broken out. In this contest, C. at first sided with the court, while his brother, prince of Conti, and his sister, the celebrated duchess of Longueville, took the part of the *Frondeurs*. After the court had secretly escaped from Paris (Jan. 6, 1649), C. concluded a treaty which insured the return of the court to Paris in Aug. of the same year. But as this service met with no adequate thanks, C., who was the haughtiest Frenchman of his age, soon became more violently rebellious than the Frondeurs themselves, at least in his language and deportment. Cardinal Mazarin consequently arrested C., with his brother and the duke of Longueville; but was soon compelled to release him, on account of the threatened operations of Turenne and the Fronde. Though C. now enjoyed the favor of the people, his relations with the court were unfriendly even after Mazarin had been banished, and when Louis XIV. assumed the government, 1651. He therefore renewed the war, with, as some suppose, the ambitious view of obtaining the supreme power. At the head of troops collected in the Netherlands, he gained the battle of Bleneau, in April, 1652, and immediately marched upon Paris, while Turenne, who had gone over to the royal side, advanced to defend the court. A bloody but indecisive struggle took place in the streets of Paris. Many of C.'s ablest adherents, however, were killed, and the Frondeurs began to give in. A treaty was drawn up, to which most of them agreed, but the proud impracticable C. would have nothing to do with it; furious at the defection of so many of his friends, he went into Champagne to gather troops, and after a fruitless effort to seize Paris, he left the country, and, on the formal outbreak of war between France and Spain, became generalissimo of the Spanish forces, but was unable to gain the advantage over Turenne. When the peace of the Pyrenees was concluded between France and Spain, it was thought advisable to enter into friendly relations with the brilliant traitor. C. was therefore pardoned, and reinstated in his former honors. The war having been renewed by Spain, 1673, he again commanded the French in the Netherlands. After Turenne's decease, he held the command in Germany, but was ultimately so disabled by gout, that he had to resign his post. He now retired to his estate of Chantilly, where he devoted his remaining years to literature (for which, in his early years, he had exhibited a strong predilection), the society of friends, and religious exercises. He died at Fontainebleau, Dec. 11, 1686. The prince of C. had a superior intellect and great strength of character, associated with pride. Though an able commander, he was disliked by the soldiers on account of his severity.—Mahon, *Life of the Great Condé* (1840), and Fitzpatrick's *Biography* (1874).

CONDÉ, Louis Henri Joseph de Bourbon, Prince de, son of Louis Joseph, and last prince of Condé, 1756–1830. When he was quite young he fought a duel with the count d'Artois (afterward Charles X.). At the siege of Gibraltar in 1782, he was wounded. In the revolution of 1793, he early came forward and served in the Condé army. He was not married, and his mistress prevailed upon him to settle his fortune on the son of Louis Philippe, the duc d'Aumale. At the revolution of 1830, he pro-

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posed to change this will, but before doing so he was found strangled. It was judicially decided that he had committed suicide.

CONDÉ, Louis Joseph de Bourbon, Prince de, 1736–1818. His father left him an orphan when he was but three years old. He was bred to arms, and won distinction in the seven years' war. In the revolution of 1793, he fled to the Rhine frontier, and with an army of fugitives co-operated with the Austrians. In 1797, he went to Russia, and served two years later in the campaign in Switzerland, and still later he was in the Austrian service. After the restoration, Louis XVIII. made him grand-master of the royal household. He wrote an essay on the life of the first Condé, and a history of the family.

CONDENSER, the apparatus used in conjunction with an electrometer to increase its sensibility, and render it available for indicating the presence of very feeble electricity. The condensing apparatus consists of two brass plates, which are placed horizontally, the lower one being connected with a metal rod to which gold leaves are attached, and the upper one being provided with an insulating glass handle. These plates are accurately ground, the one to the other, so that when placed upon each other, they touch in every part. Their inner surfaces are covered with a very thin and equable layer of shellac. When an observation is made, the excited body is brought into contact with the lower plate, and the finger of the observer is laid upon the upper. This being done for a sufficient time, the finger is first removed, and then the excited body, after which the plate is lifted by its handle parallel to the other plate, the gold leaves at the same time diverging under the influence of the electricity left in the lower plate. The same observation might have been made with the positions of the finger and the excited body reversed, but the leaves would then be charged with the opposite electricity to that of the excited body. Reverting to the first case, the electricity to be tested is communicated to the lower plate in small successive charges, which, acting through the thin layer of shellac, induce, as in the Leyden jar, a corresponding charge of the opposite electricity on the lower surface of the upper plate, and send the similar electricity of the upper plate through the finger into the ground. Each weak charge of electricity given to the lower plate is not allowed to dissipate, but is kept fixed or bound by the corresponding charge of the opposite electricity which it has induced on the upper plate, so that an accumulation of such charges takes place. As yet, however, there is no excitement visible in the gold leaves, the electricity so condensed in the plate being capable of acting only in one direction—viz., towards the charge of the upper plate. When, however, the plate is removed, the collected electricity of the lower plate being no longer restrained to act towards it, immediately extends to the leaves below, and causes a marked divergence. In this manner, electricity of too low a tension to affect immediately the gold leaves can be condensed, so as to possess the power of doing so.

It is found that the efficiency of the C. depends upon the accurate grinding of the plates, the thinness and evenness of the layer of shellac with which their inner surfaces are varnished, the size of the plates, and their parallelism on removal. This last is of the utmost importance; and it is found, where numerical results are wanted, that little dependence can be placed on the parallelism attained by the hand. For more accurate observations, the C. is made quite separate from the electrometer. The plates are in this case attached vertically to two wooden pillars, on which they are insulated, and which slide in a horizontal groove made in the sole of the instrument. The plates, thus guided by the grooves, are made to approach and to retire from each other with their faces parallel. In a C. of this description, no shellac varnish is used, the air between the plates acting as the dielectric in its place. When one of the plates is connected with the knob of the electrometer, the observation proceeds as already detailed.

CONDENSING STEAM-ENGINE. See Steam-engine.

CONDER, Josiah, 1789–1855; an English author, editor of the *Eclectic Review* and *The Patriot*. He published also many works on religious, political, and miscellaneous subjects. The most popular of these was his *Modern Traveler*, a series of 30 volumes descriptive of the various countries of the globe.

CONDESCEN'DENCE. In the judicial procedure of Scotland, a C. is an articulate statement of the facts, accompanied with a note of the grounds in law on which the pursuer of an action rests. Formerly, the C. was a separate pleading from the summons, or judicial writ by which the defender is called into court. By the passing of 13 and 14 Vict. c. 36 (31st Oct., 1850), and several subsequent statutes, the forms in Scotland were very much simplified. The summons, in place of containing a rambling statement of the grounds of action, which was afterwards to be rendered articulate and explicit by the C., is now a merely formal writ, setting forth the name and designation of the pursuer and defender, and the conclusions of the action. To the summons, however, is appended a C. setting forth the grounds of action in articulate statements, and to this again is subjoined a note of pleas in law, so that the whole case of the pursuer is contained in the very first pleading in the cause. The papers on both sides may be revised if necessary; and the record, as the written pleadings and productions are called, is then djusted by the judge. The cause is then ready for debate (q.v.).

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CONDESCENDENCE AND CLAIM. See MULTIPLEPOINDING.

CONDILLAC, ETIENNE BONNOT DE MABLY DE, a French philosopher of the 18th c., was b. at Grenoble, 1715. In early youth, his delicate health delayed his progress in education. In 1746, he published his *Essai sur l'Origine des Connaissances Humaines*, a work which derives all thought and knowledge from the exercise of the senses. It was intended to carry out the principles of Locke, which were misunderstood and misrepresented by C. as entirely based on sensationalism. To refute various metaphysical theories, C. wrote a *Traité des Systèmes* (1749). In 1754, appeared his *Traité des Sensations*—a work supplying the details of the sensational theory. C. supposes a statue organized within like a man, but its body—so to speak—being composed of marble, hinders it from possessing any sensibility. C. further supposes himself to have the power of endowing the statue with one sense after another, until it becomes perfectly a human being, and so endeavors to show that as it would then possess exactly the same kind of ideas as ourselves—and yet while destitute of sensations, possessed none—it logically follows that ideas spring exclusively from sensations. In all his writings, C. displayed acuteness in analysis, and, as consistently as was possible, adhered to the extreme theory of sensationalism. C. passed his life mostly in quiet retirement, and died at his estate near Beaugenci, Aug. 3, 1780.

CONDIMENTS, or seasoning agents, are those substances which are employed at table for the purpose of imparting a flavor or seasoning to the ordinary solid or liquid food. The greater part of C. are necessary to sustain the proper functions of the alimentary system, and, besides gratifying the appetite, minister, more or less, to the wants of the structure. The principal C. are saline substances, such as common salt; acidulous bodies, such as acetic acid or vinegar; oily C., such as butter and olive-oil; saccharine substances, such as sugar and honey; and aromatic and pungent C., such as mustard, ginger, pepper, and pickles.

CONDITION, a term of special importance in the law of real property, but applied also in that of bequests and contracts. A condition is a limitation or restriction joined to an estate, interest, or right, and on the fulfilment of which depends its taking effect, continuance, or termination. Loosely, the term is also used to denote the clause in a written statement by which the relation just defined is expressed. The condition necessarily refers to a future event or contingency, one not inhering in the main transaction itself. In the conveyance of real estate it is not necessary that the condition be incorporated in the original statement of conveyance; it may be contained in a separate statement, if this be made formally part of the original transaction. In the common law system of conveyancing a condition may be made for the benefit only of the grantor, his heirs and personal representatives, not to the benefit of a person who is not a party to the transaction; this restriction has been generally removed by statute, but is still retained in some of the United States. Conditions are classified and distinguished in several ways: the most common and important distinction is between a *condition precedent* and a *condition subsequent*. The former is one which must be complied with or take place before the estate or right to which it is attached can go into effect or become vested; thus, where real estate is granted on a lease for a term of years upon condition that if the lessee pay a given sum at a certain day he shall receive the fee, i.e., absolute possession—here the condition described is a condition precedent. A condition subsequent is one which may be complied with or carried out after the right or estate to which it is joined has taken effect, or at least has begun to do so; thus, when the real estate is granted directly in fee, but upon the condition that if the grantee do not pay the grantor a fixed sum on a given day his estate shall no longer exist—here the condition is a condition subsequent. In the law of real property an important distinction, also is that between a condition and a *conditional limitation;* the latter is a condition subsequent, as described above, with the addition that on the failure to perform the condition the estate terminates absolutely without any act on the part of the grantor, while in the condition subsequent the benefit inures to the grantor or his representatives only when they make due claim and entry thereon. Express conditions are those stated in words, while implied conditions are those not so expressed, but which the law recognizes as involved in the circumstances; an example of an implied condition is where a state appoints a person to an office—here the law will recognize the implied condition that if the officer do not properly perform the legal duties of his office the grantor—that is, the state—has the right to terminate the grant of the office. Conditions impossible of fulfilment or unlawful in their character are universally void. The question of how far a condition, in a will, in restraint of marriage is unlawful has been answered by high judicial authorities to the effect that it is unlawful only when it is absolute and without exception and when it is attempted to be imposed on a person who would otherwise have a natural right of succession in the estate.

CONDITION, in logic, denotes that which must precede the operation of a cause. It is not regarded as that which produces an effect, but as that which renders the production of one possible. For instance, when an impression is made on wax by a seal, the seal is said to be the cause; the softness or fluidity of the wax, a condition. Some logicians, however, are of opinion, that the distinction usually made between C. and cause is arbitrary

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CONDITIONAL IMMORTALITY. The doctrine advanced by certain theologians, that the immortality of the soul is only conditional upon faith in Christ; and that immortality is not inherent in the race. See ANNIHILATIONISM.

CONDITIONED, THE PHILOSOPHY OF THE. This phrase has been brought into use by sir W. Hamilton, to express the inability of the human mind to conceive or reason respecting the absolute and the infinite. Our thought, according to him, can only be of the *relative* and the *finite*, of which these terms are but the negations; relativity and finitude are the conditions under which the human intelligence operates. In a dissertation on this subject (*Discussions in Philosophy*, p. 1), he criticises and endeavors to refute the opposite position as maintained by Cousin—a modification of the previous doctrine of Schelling—that "the unconditioned, the absolute, the infinite, is immediately known in consciousness, and this by difference, plurality, and relation."

As this doctrine of sir W. Hamilton has been raised into an especial importance by Mr. Mansel in his *Bampton Lectures*, some account of the reasonings adduced in its favor may here be given. We shall first quote the author's own statement:

"In our opinion the mind can conceive, and consequently can know, only the *limited, and the conditionally limited*. The unconditionally unlimited, or the *infinite*, the unconditionally limited, or the *absolute*, cannot positively be construed to the mind: they can be conceived only by thinking away from, or abstraction of, those very conditions under which thought itself is realized; consequently, the notion of the unconditioned is only *negative*—negative of the conceivable itself. For example: On the one hand, we can positively conceive neither an absolute whole, that is, a whole so great that we cannot also conceive it as a relative part of a still greater whole; nor an absolute part, that is, a part so small that we cannot also conceive it as a relative whole, divisible into smaller parts. On the other hand, we cannot positively represent, or realize, or construe to the mind (as here understanding and imagination coincide) an infinite whole, for this could only be done by the infinite synthesis (union) in thought of finite wholes, which would of itself require an infinite time for its accomplishment; nor, for the same reason, can we follow out in thought an infinite divisibility of parts. The result is the same, whether we apply the process to limitation in *space*, in *time*, or in degree. The unconditional negation, and the unconditional affirmation of limitation; in other words, the *infinite*, and the *absolute, properly so called*, are thus equally inconceivable to us."—*Discussions*, p. 13, 2d edition.

The fundamental ideas involved in this view are certain observed facts with reference to the human mind, or the human consciousness; which facts, although very much overlooked in former times, are now beginning to be pretty generally recognized. It is a general law of our mental constitution, that change of impression is essential to consciousness in every form. The remark was made by Hobbes, that it is "almost all one for a man to be always sensible of one and the same thing, and not to be sensible at all of anything." There are notable examples to show that an unvarying action on the senses fails to give any perception whatever. Take the pressure of the air on the surface of the body. Here we have an exceedingly powerful effect upon one of the special senses. The skin is under an influence exactly of that nature that wakens the feeling of touch, but no feeling comes. Withdraw any portion of the pressure, as with a cupping-glass, and sensibility is developed. A constant impression is thus, to the mind, the same as a blank. Our partial unconsciousness of our clothing is connected with the constancy of the object. Remission or change is, therefore, absolutely requisite.

The necessity of change in order to produce feeling or consciousness of any sort, must apply to the special kind of consciousness that we call knowledge. To know light, is to pass from its presence to its absence, or the opposite; everlasting, unvarying luminosity, in an eye always awake, would not be known to the human mind. It is transition that develops knowledge, whence flows the important consequence, that knowledge *never can be of one property alone;* there must always be at least two properties in every act of knowing. We may say that we know light; but in so doing we also know darkness, and we could not know either by itself. When we touch clay and marble, we know hard and soft; but if we had never touched a soft body, we should have no conception of a hard one. Living in one constant temperature, like the fish in the tropical seas, we should know neither heat nor cold; passing from a high temperature to a low, or from a low to a high, we know both; and such is the alternative presented in every case to the human understanding. This great fundamental law of the human mind is now commonly designated by the phrase, *the relativity of knowledge*.

Mr. Mansel, accordingly, disputes the possibility of our conceiving the infinite, by showing that such a conception passes the limits of human consciousness. The following extract will show his mode of reasoning: "Now, in the first place, the very conception of consciousness, in whatever mode it may be manifested, necessarily implies *distinction between one object and another*. To be conscious, we must be conscious of something; and that something can only be known as that which it is, by being distinguished from that which it is not. But distinction is necessarily limitation; for, if one object is to be distinguished from another, it must possess some form of existence which the other has not, or it must possess some form which the other has. But it is obvious that the infinite cannot be distinguished, as such, from the finite, by the absence of any quality which the finite possesses; for such absence would be a limitation. Nor yet can

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it be distinguished by the presence of an attribute which the finite has not; for, as no finite part can be a constituent of an infinite whole, this differential characteristic must itself be infinite, and must at the same time have nothing in common with the finite. We are thus thrown back upon our former impossibility."—Lecture 3d.

"A second characteristic of consciousness," according to Mr. Mansel, "is, that it is only possible in the form of a *relation*. There must be a subject, or person conscious, and an object, or thing of which he is conscious. There can be no consciousness without the union of these two factors; and, in that union, each exists only as it is related to the other. The subject is a subject, only in so far as it is conscious of an object; the object is an object, only in so far as it is apprehended by a subject; and the destruction of either is the destruction of consciousness itself. It is thus manifest that a consciousness of the absolute is equally self-contradictory with that of the infinite. To be conscious of the absolute as such, we must know that an object which is given in relation to our consciousness, is identical with one which exists in its own nature, out of all relation to consciousness. But to know this identity, we must be able to compare the two together; and such a comparison is itself a contradiction. We are, in fact, required to compare that of which we are conscious, with that of which we are not conscious, the comparison itself being an act of consciousness, and only possible through the consciousness of both objects."

The author then lays down a third condition of consciousness—namely, relation to *time*. Everything conceived by us is conceived as under the two manifestations of *succession* and *duration*, from which he endeavors to show "that an act of *creation*, in the highest sense of the term—that is to say, an absolutely first link in the chain of phenomena, preceded by no temporal antecedent—is to human thought inconceivable. To represent in thought the first act of the first cause of all things, I must conceive myself as placed in imagination at the point at which temporal succession commences, and as thus conscious of the relation between a phenomenon in time and a phenomenon out of time. But the consciousness of such a relation implies a consciousness of both the related members; to realize which, the mind must be in and out of time at the same moment.

And, further: "Subordinate to the general law of time, to which all consciousness is subject, there are two inferior conditions, to which the two great divisions of consciousness are severally subject. Our knowledge of body is governed by the condition of *space*, our knowledge of mind by that of *personality*. I can conceive no qualities of body save as having a definite local position; and I can conceive no qualities of mind save as modes of a conscious self."—Lecture 3d.

By the application of those four conditions or limitations of human consciousness—distinction, relation, succession, and duration in time, and personality as regards the conception of mind—it is Mr. Mansel's purpose to demolish the foundations of the metaphysical theology of former ages, which was largely conversant with proofs *à priori* of the infinity and the absolute existence of a Deity. According to him, a rational theology is impossible to be attained. "Our whole consciousness manifests itself as subject to certain limits, which we are unable, in any act of thought, to transgress. That which falls within these limits, as an object of thought, is known to us as *relative* and *finite*. The *absolute* and the *infinite* are thus, like the *inconceivable* and the *imperceptible*, names indicating, not an object of thought or of consciousness at all, but the mere absence of the conditions under which consciousness is possible. The attempt to construct in thought an object answering to such names, necessarily results in contradiction—a contradition, however, which we have ourselves produced by the attempt to think—which exists in the act of thought, but not beyond it—which destroys the conception as such, but indicates nothing concerning the existence or non-existence of that which we try to conceive. It proves our own impotence, and it proves nothing more."

Sir William Hamilton's theory, propounded by himself and supported by Mr. Mansel, has been given above. We draw from Pres. McCosh, in his *Scottish Philosophy*, a brief statement of the argument on the other side. Hamilton, in the construction of his philosophy of the relative or conditioned, has expended an immense amount of logical ability, but has also lost himself in Kantian distinctions; giving in to Kant's theory as to space and time; making them, and also cause and effect, merely subjective laws of *thought* and not *things*. And the system which he has reared is an artificial one, in which the flaws and oversights and rents are quite as evident as the great skill which he has shown in its erection.

1. His theory of relativity is false. There is a sense in which all sound thinkers hold that human knowledge is relative; but this is not the same as that elaborated by Hamilton. It must be admitted that we know things only so far as we have the capacity to know them, and that we do not know all things; nay, that we do not know all about any one thing. But these facts concerning our knowledge are not fairly set forth by the term "relative." We should say rather that our knowledge is imperfect, or partial. But so far as it extends it is actual knowledge. Everything that we know we know as existence; and it is the thing itself that we know. We do not know all about it; but so far as we have knowledge it is knowledge of the thing itself. If in what we call knowledge there be any points not belonging to

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the thing, they must be rejected, and our assumed knowledge will be so far lessened; but that which remains will be knowledge of the thing itself. The mind must carefully guard against all addition to the thing of matters which do not belong to it. To say that our mental faculties cannot make this distinction would be to say that they are incapable of guiding us; and even that they are so constituted as to lead us astray. 2. Hamilton's theory of the relativity of knowledge led him to deny that there can be any valid argument for the existence of God except the moral one. While we admit that the moral argument, rightly stated, is the most satisfactory, we also maintain that the argument from order and adaptation, combined with right views concerning cause and effect, does prove the existence of a living Being of great power and wisdom, who created, upholds, and governs the universe. This universe, the more it has been observed, searched into, and discovered by men of all successive generations, has been seen to be profound, vast, and practically boundless. Our knowledge, thus advanced, carries us forward to the conception that the author of the universe is infinite. And our conception of infinitude as belonging to Him, although imperfect, is positive. In our minds it is something, not from which all thinkable things have been abstracted, but into which all thinkable good things have been conveyed until the mind reaches the limit of its powers yet finds no end. To this from Dr. McCosh may be added the suggestion that the assertion that we can have no knowledge concerning the infinite is self-contradictory, inasmuch as it involves the assertion that we *do know* the infinite as *unknowable*. The Philosophy of the Conditioned has strangely served as a basis for the ingenious and brilliant speculations of Agnosticism, so rife in recent years, but now showing signs of modification even to the vanishing point.

CONDITIONS. The popular name in American college parlance for deficiencies on the part of a student in examinations. It derives its force from the fact that the student is permitted to go on with his class only on *condition* that the deficiency be made good within a given time, failing which his name is dropped from the college rolls. A bit of doggerel Latin verse on this topic is familiar to American students. It begins:

"Ah, me!
Conditione!
Quid pater meus dicet mi,
Si redeam conditione?"

CONDITIONS OF SALE, are the terms upon which property is sold at auction. The custom is for the possessor of the property to reduce the terms to writing or printing, and to expose them in the auction room, when the terms become binding upon both parties, and cannot be altered by anything said at the time of the sale.

CONDIVI, ASCANIO, an Italian painter, was born near Ancona in 1520. He studied under Michael Angelo for many years, and is said to have remained in his household throughout his lifetime. This intimacy makes his *Life of Michael Angelo*, which appeared in 1553, peculiarly valuable to students of art-history. The date of his death is unknown.

CONDIVINCUM. The Roman name of NANTES (q.v.).

CONDOM, a t. of France, in the department of Gers, pleasantly situated on a height on the river Baise, here crossed by two bridges, 25 m. n.n.w. of Auch. The town is very old, having been founded in 721, is irregularly built, but has handsome suburbs. It has a handsome Gothic church, an exchange, and hospitals. There is a very considerable trade in grain, flour, wine, and brandy, and manufactures of cotton and mixed fabrics, cotton yarn, etc. C. was formerly the capital of an extensive district, now comprised in the departments of Gers, Landes, and Lot-et-Garonne. Bossuet was at one time bishop of Condom. Pop. '91, 7405.

CONDOMOIS. A former district of France, of which Condom (q.v.) was the capital.

CONDONATION, in the legal phraseology both of England and America, means forgiveness, or *remissio injuriarum*, when urged as a defense against an action of divorce on the ground of adultery. Condonation may be either expressed or implied. If the parties have cohabited after a knowledge of the offense complained of, this is an *implied* condonation of the offense, and bars complaint unless the offense shall have been subsequently repeated. An act once condoned is, in the eyes of the law, as though it had never been committed; though, as already stated, a repetition of it is not excused by the fact that a former act has been condoned. See DIVORCE.

CONDOR, *Sarcoramphus gryphus*, the great vulture of the Andes, and the largest of known flying birds. Its dimensions, however, were for a long time greatly exaggerated. It is not always much larger than the *lämmergeyer* of the Alps, being sometimes scarcely more than 4 ft. long, and its expanse of wings about 9 ft. although these dimensions are often considerably exceeded, and the expanse of wings reaches fully 14 feet. The wings are long, and extremely powerful; the tail short, and wedge-shaped; the general color black, which is brightest in old males, the young being of a brownish color, which has given rise to a notion that there are two species · the males

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are also distinguished by having great part of the wings white. Around the lower part of the neck of both sexes there is a broad white ruff of downy feathers, above which the skin is bare, and exhibits many folds. The head of the male is crowned with a large cartilaginous comb, and the neck is furnished with a dilatable wattle. The beak is thick and strong, straight at the base, but the upper mandible strongly curved at the extremity. The C. feeds mostly on carrion. Its voracity is enormous. Tschudi mentions one in confinement at Valparaiso which ate 18 lbs. of meat in a single day, and seemed next day to have as good an appetite as usual. Condors often gorge themselves so that they cannot fly, and, if attacked, must disgorge in order to escape. They inhabit regions 10,000 or 15,000 feet above the level of the sea, where they breed, making no nest, but laying their eggs on the bare rocks, and where they are usually seen in small groups. To these haunts they return, after their descents into the plains for food. The height to which the C. soars in the air exceeds that of any other bird, and is said to be almost 6 perpendicular m. above the level of the sea, or nearly six times the ordinary height of the clouds.—To the same genus with the C., distinguished by the cartilaginous comb, bare neck, and peculiar shape of bill, belong the king vulture, or king of the vultures (*S. papa*), of the warm parts of America, and the Californian vulture (*S. Californianus*). The king of the vultures is about the size of a goose, and derives its name from its driving away other vultures from prey at its pleasure. Its plumage is finely colored, reddish above, white beneath, with bluish-gray ruff, and black quills and tail. —The birds of this genus have no voice, and make only a sort of weak snorting. See illus., DEER, ETC., vol. IV.

CONDORCET, JEAN ANTOINE NICOLAS DE CARITAT, Marquis de, an eminent French author, was b. Sept. 17, 1743, at Ribemont, near St. Quentin, in the department of Aisne; studied at the college of Navarre; and by his *Essai sur le Calcul Integral* (afterwards given in an extended form in his *Essais d'Analyse*), gained for himself, at an early age, a seat in the academy of sciences. With ease and remarkable ingenuity, C. treated the most difficult problems of mathematics; but though deserving high praise, his powers lay rather in suggestion than in rigorous demonstration. After the appearance of his *Éloges des Académiciens Morts avant* 1699 (Paris, 1773), he was made secretary of the academy, 1777. His theory of comets gained, in the same year, a prize in the Berlin academy. In concert with Turgot, he was induced to subject the system of the economists to a close examination, and was led by D'Alembert to take an active part in the *Encyclopédie*. In all his works—as, for example, in the *Éloges et Pensées de Pascal*—we find noble views of human destiny, and evidences of a truly benevolent disposition. At the revolution, he was elected member for Paris in the legislative assembly, of which he was president in 1792. In the national convention, as deputy for the department of Aisne, he mostly voted with the Girondists, and shared in the downfall of that party. Accused, in Oct., 1793, he concealed himself, and consequently was outlawed. A generous lady, Mme. Verney, had the courage to provide for him a hiding-place, where he remained for some months, and in very miserable circumstances wrote his most remarkable work, the *Esquisse des Progrès de l'Esprit Humain*. Having afterwards quitted his concealment, he was arrested at Clamart, sent to Bourg-la-Reine, and cast into prison. The next morning, Mar. 28, 1794, he was found lying dead on the floor. He had, it is believed, poisoned himself. His collected works (exclusive of his mathematical essays) were edited by Garat and Cabanis (21 vols., Paris, 1804).—His wife, SOPHIE DE C. (sister of marshal Grouchy), born 1765, assisted in the literary labors of C., and also translated into French Adam Smith's *Theory of Moral Sentiments*. She died Sept. 6, 1822.

CONDOTTIE'RI, the name given in the 14th c. to the leaders of certain bands of military adventurers who, for booty, offered their services to any party in any contest, and often practiced warfare on their own account purely for the sake of plunder. These mercenaries were called into action by the endless feuds of the Italian states during the middle ages. Among the most celebrated of their leaders were Guarnieri, Lando, Francis of Carmagnola (about 1412), and Francis Sforza (about 1450). The last-mentioned made himself duke of Milan. The *Compagnies Grandes* in France, during the 14th c., resembled the bands led by the Italian condottieri. They originated in the long bloody wars between France and England. The mischief done by them became so intolerable, that in several parts of the country the peasantry armed themselves, and, under the name of *pacifères*, formed associations against the plunderers. Nevertheless, these French C. were so powerful that, in 1361, they routed the king's forces which had been sent against them, at Brignais, near Lyon, and slew the constable of France, Jacques de Bourbon; but the constable du Guesclin having persuaded them to seek their fortune in the Spanish service, they at length disappeared from the country.

CONDUCTOR, in music, is the person placed at the head of an orchestra to lead the performance. Much of the effect of orchestral music is due to the good taste of the conductor, and to his knowledge and skill in drilling the musicians.

CONDUCTORS, in the English artillery, are those artillerymen who have charge of the ammunition-wagons in the field; they are, to some extent, under the control of the commissariat officers, who have to provide means of transport: but more exclusively under the control of their own proper artillery officers.

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CONDUCTORS AND NON-CONDUCTORS, OR INSULATORS, OF ELECTRICITY. The property of electrical conductivity is possessed in some degree by all known substances There is, however, an enormous difference between the conductivity of those that are used as conductors and those that are used as insulators, the former having about one hundred million times the conductivity of the latter. The substances at the lower end of the scale are therefore of sufficiently low conductivity to serve for covering and supporting wires made of the good conductors, without permitting any serious escape of an electric current when the wires are charged.

In leading electricity from point to point, through telegraph or electric light lines, for example, those substances possessing the property of conductivity in the highest degree, such as copper and iron, are selected to form a path for the conductor or wire, and these are surrounded with materials which have the least conductivity or offer the highest resistance, such as air, rubber and glass, in order to confine the current and compel it to travel to the end of the wire. When a conductor is so surrounded or so placed on non-conducting supports that it prevents the electricity communicated to it from passing into the ground or escaping, it is said to be insulated.

As the difference between conductors and insulators is merely one of degree, there is, even under the best conditions, a loss in the transmission of electricity over a line of wire proportionate to the amount of leakage through the insulation and the resistance to travel offered by the wire itself, since the slight effort required of the current to force its way ahead through the wire causes some of it to escape through the insulation in the same way that water forced through a long pipe will escape in small quantities at weak points. It is, indeed, extremely necessary to prevent conductors buried in the earth from having any connection with water or dampness, and if the insulation of the conductor be defective in a damp spot, a certain proportion of the current will leave the conductor and travel through the earth. Chemically pure water is a non-conductor, but as found in the earth, water is an excellent conductor on account of the materials it holds in solution.

The electrical conductivity and, its reverse, the resistance of materials, are, therefore, subjects of absolute importance to electricians; and the selection of materials of high conductivity or low resistance for wires, and materials of high resistance for insulators, receives careful attention. The best conductors are gold, copper, silver, aluminium, brass, iron, and all metals. The best insulators or the worst conductors are dry air, glass, mica, porcelain, paraffine, rubber, silk, gutta-percha, and almost all the hydrocarbons. The intermediate substances are many liquids and damp substances, carbon, minerals, and compound substances. The conductivity of all substances is greatly affected by changes of temperature. An increase of temperature increases the resistance of all the metals, while it has the opposite effect in other substances. Glass loses its insulating properties at a red heat, and so do wax, sulphur, amber, and shellac when fused.

Glass, if not the most perfect insulator, far exceeds others in hardness and durability, and is much employed as insulation for light electrical apparatus.

CONDURANGO (South American). A name given to several plants belonging to the Asclepiadaceæ (q.v.), used as a remedy for venomous bites.

CONE. There are various kinds of cones, but the term is usually applied only to those having circular bases. The most common kind of circular C. is the *right* C., which may be conceived as being generated by the revolution of a right-angled triangle round one of its legs. The line from the apex of a C. to the center of the base is called the axis, and, in the right C., it is perpendicular to the base. In the *oblique* C., the axis is inclined to the plane of the base at an angle other than a right angle. A *truncated* C. is the lower part of a C. cut by a plane parallel to the base.—Four curves, called the CONIC SECTIONS, may be formed by cutting the right C. in different directions. If the C. be cut by a plane parallel to the base, the section is a circle; if the plane cut the C. across, making any angle other than a right angle with its axis, the section is an ellipse; if the cutting plane be parallel to the side of the C., the section will be a parabola. In every other case than those stated, the section will be an hyperbola. If two cones were set one above the other, the one being just a continuation of the other through the apex, the plane producing the hyperbolic section would cut the second as well as the first, though none of the other planes would. There are thus two equal branches of the hyperbola belonging to the two cones respectively. See CIRCLE, PARABOLA, etc.

CONE, *Strobilus*, in botany, a fruit-bearing spike covered with scales, each of which has two seeds at its base. Such are the fruits of the *coniferæ* (fir-cones or fir-tops), from the usual shape of which the name C. is derived, also the fruits of the *casuarineæ*. The name C. is applied also to the female spike, even when in flower. The scales of true cones, until they separate to allow the dispersion of the seeds, are closely compacted together; in the hop, to the fruit of which the name C. is not applied, although *strobilus* is, they are loose. Some true cones, as those of the *araucaria*, are very far from being conical in shape. The fruit of the juniper (a *galbulus*) is a C. of which the scales have become fleshy, so as to form a false berry.

CONE, SPENCER HOUGHTON, D.D., 1785–1855; b. N. J.; studied at Princeton college. His mother became a widow when he was about 14 years of age, and he undertook teaching to support the family. He also became an actor, and played in Philadelphia and other cities with good success for seven years. He was engaged to be married, but the prospective bride required him first to abandon the stage, which he did, and took an

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editorial position on a Baltimore newspaper. During the war with England, he served in the army, and was present in the attack on Washington and Baltimore. He next turned his attention to the pulpit, and while holding a small government office, preached in some churches in Washington and the neighborhood. In 1815–16, he was chaplain to congress, and in 1823 was called to the Oliver street Baptist church, New York city. In 1841, he took charge of the Broome street church, where he remained during life. In 1832, he presided over the Baptist general conference for the United States. During his entire ministry he was conspicuous in all branches of church work. In 1850, he, with others, published a pamphlet recommending a new translation of the Bible. The idea did not find favor at the time, but the work was undertaken at a later period through the agency of the American Bible union, an organization of which Cone was the president.

CONE'CUH, a co. in s. Alabama, on the Escambia river, crossed by the Louisville and Nashville railroad; pop. '90, 14,594, includes colored. The surface is hilly, and the soil sandy. Cotton is the most important crop. Co. seat, Evergreen. Area, 804 sq. m.

CONEGLIAN'O, a t. of northern Italy, 28 m. n.e. of Venice. It is situated on a hill-slope, crowned by an extensive castle, and has a very picturesque appearance. Half-obliterated frescoes adorn the outside of several houses in the town, which also contains the triumphal arch built in honor of the Emperor Francis I. Pop. between 8000 and 9000.

CONE'JOS, a co. in s.w. Colorado, situated on the New Mexico border, bounded e. by the Rio del Norte; 1200 sq.m.; pop. '90, 7193. There are several ranges of mountains in the co.; but also much good land, and gold and silver deposits. Denver and Rio Grande railroad passes through. Besides Indians, the inhabitants are chiefly Mexicans or half-breeds. Co. seat, Conejos.

CONE-SHELL (*conus* and *conidæ*), a genus and family of gasteropodous mollusks, of the order *pectinibranchiata*, having a shell of remarkably regular conical form; the spire on the base of the cone, and sometimes rising from it to a sharp point, sometimes almost flat; the aperture narrow and straight, without protuberance or fold, extending from the base of the cone to its apex. The head of the animal has a proboscis capable of much extension; the mantle is scanty and narrow, forming an elongated siphon in front; the shell covered with an epidermis. These mollusks are carnivorous; they inhabit shores and banks of sandy mud, chiefly within the tropics, a few only occurring in the Mediterranean. The shells of many species are very beautiful, and much prized by collectors.—Cone-shells first appear in the chalk, and become more abundant in the more recent formations.

CONESTO'GAS, or GANDASTOGUÉS, Indians once living in Pennsylvania, called by the people of Maryland "Susquehannas," and by the Dutch "Minquas." They were of the Iroquois family, and were once very powerful. Near the close of the 16th c., they nearly exterminated the Mohawks, and held several tribes in subjection After almost continual war with their neighbors for a century, they were quite subdued in 1675. Their king made a treaty with William Penn in 1701. Another treaty was made with them in 1742, at which time but few of the tribe were left. During an excitement against red men in 1763, the few remaining members of the tribe took refuge in the jail at Lancaster, Pa., where they were murdered by a band of white ruffians. One of the foremost of their chiefs was Logan (in Indian, Tah-gah-jute), whose speech so famous for eloquence and pathos will be well remembered by people who were familiar with American school-books of the early part of the 19th century. The Swedish missionary Campanius made a vocabulary of the Conestogas language.

CONEWAN'GO CREEK, a small stream in Cattaraugus co., in w. New York, which forms part of a line of continuous water navigation from the gulf of Mexico through the Mississippi, the Ohio, and the Alleghany rivers, and this creek and Chautauqua lake, to a point only 10 m. from lake Erie.

CONEY ISLAND, in Kings co., N. Y., 9 m. s.e. of New York city. It was one of the first places of landing of the Dutch discoverers, and for 240 years was regarded as worthless except for pasturage. About 1840, steam-boats began Sunday and holiday excursions from the city to Coney Island, and cheap hotels and rude bathing-houses were put up. For the next 25 years the island was a favorite though not always reputable resort; but the extraordinary growth of New York, and especially of Brooklyn, turned attention to the island as a summer resort, and better accommodations were provided, order was enforced, and it became fit for the reception of respectable people. About 1875, a great impetus was given to its popularity by the construction of steam railroads and the erection of immense hotels of the best class, and for a few years the island was visited by more people during the summer season than any other place of resort in America. It is reached by several lines of railroads and steamboats. The island is nearly 5 m. long by ¼ to ¾ wide. It is separated from the mainland by a narrow tidal stream, and on the ocean shore are Seagate, Sea Beach, Manhattan, and Brighton beaches. It is part of the borough of Brooklyn in Greater New York.

CONFARREA'TION was a peculiar mode of marriage in use among the Romans, and supposed to have been originally that practiced by the patricians. Its specialty consisted in the employment of certain words in the presence of 10 witnesses, and in the performance of a religious ceremony in which *panis farreus* (bread made of spelt)

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was used. Various priestly offices, such as that of the *flamen dialis*, were open only to those who were born of parents thus married.

CONFECTIONERY, preparations of sugar, or of material of which sugar is the principal ingredient. There are endless varieties of these preparations, from simple candies unadorned and shapeless, to the most elegant and costly works of art. One of the simplest forms is that of lozenges, or drops of plain or flavored sugar. In making these the sugar is ground to a fine powder, after which it is mixed with dissolved gum arabic so as to form a stiff dough; then rolled, or cut and pressed by machinery into the required forms. Another variety is known as comfits. To make these a core or center of some kind is required, and these cores consist usually of nuts or small fruits, varying from a caraway seed to a peach or a pear. Around such cores successive layers of sugar are deposited until the required size is reached; and to do this the cores are placed in large copper vessels which are geared so as to move back and forth in a small angle, whereby the cores are kept in constant motion, the mixture being steadily supplied with pure strained sirup of sugar. Much talent is expended in large cities in making and ornamenting confectionery for table show-pieces. Where confectionery is pure its use may involve little danger to health. Unfortunately it cannot be doubted that a large proportion of the cheaper kinds are adulterated, and colored with poisonous stuffs.

CONFEDERATE STATES OF AMERICA. See REBELLION, WAR OF THE.

CONFEDERATION, an alliance of nations, states, or princes; sometimes used for a single nation, as that of the Mexican republic, the official title of which is "The Mexican Confederation." The German confederation was formed immediately after the Vienna congress of 1815. In July, 1778, the united colonies (afterwards the United States of America) agreed to the "Articles of Confederation and perpetual Union between the states of New Hampshire, Massachusetts Bay, Rhode Island and Providence Plantations, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia." In these articles are set forth the principles of government which were a few years later embodied in the constitution of the United States, with such additions as were necessary "in order to form a more perfect union." In South America is the Argentine confederation, and Switzerland is sometimes called the Swiss confederation. The confederation of the Rhine was formed in 1806 by a number of German states, under the protection of Napoleon.

CONFEDERATION, GERMAN. See GERMANY.

CONFEDERATION, IMPERIAL. See IMPERIAL FEDERATION.

CONFEDERATION OF THE RHINE. During the war of 1805, so disastrous for Austria, several German princes, too weak to remain neutral, were forced to ally themselves with France. The first to do so were the electors of Bavaria and Würtemberg, who, in recompense of their services, were elevated to the dignity of kings by the peace of Presburg, 26th Dec., 1805. Some months after (28th May, 1806), the arch chancellor of the empire announced at the diet that he had chosen as his coadjutor and successor cardinal Fesch, the uncle of Napoleon, a thing entirely contrary to the constitution of the Germanic empire. Finally, at Paris, on the 12th July, 1806, 16 German princes formally signed an act of confederation, dissolving their connection with the Germanic empire, and allying themselves with France. These 16 princes were—the kings of Bavaria and Würtemberg, the arch chancellor, the elector of Baden, the new duke of Cleves and Berg (Joachim Murat), the landgraf of Hesse-Darmstadt, the princes of Nassau-Usingen, Nassau-Weilburg, Hohenzollern-Hechingen, Hohenzollern-Sigmaringen, Salm-Salm, Salm-Kyrburg, the duke of Arenberg, the princes of Isenburg-Birstein and Lichtenstein, and the count of Leyen. These individuals justified (or were forced to justify) their conduct by enumerating the vices of the constitution of the Germanic empire, and invited the remaining princes of Germany to imitate their example. At the same time, Bacher, the French ambassador, declared that his master no longer recognized the Germanic empire; while the territories and the titles of the confederate princes (who were now under the protectorate of Napoleon) underwent very considerable changes. In addition to these changes, a number of other princes and nobles of the empire were made dependent on the confederation. During the years 1806–1808 several other petty German sovereigns, alarmed at the triumphs of Napoleon, hastened to enroll themselves members of this unpatriotic league; and at the close of 1808, it embraced a territory of 122,236 sq.m., contained a population of 14,608,877 souls, and kept up an army of 119,180 men. The utter ruin which overtook the French army in the Russian campaign acted like a solvent on the confederation, and the year 1813 saw it vanish like mist in the sudden outburst of German patriotism, when a whole people leaped up as one man, and delivered themselves from a cruel and insulting bondage.

CONFERENCE, a coming together to consult upon any cause or course. In legislation there are often committees of conference when the two houses of congress or of a state legislature disagree on any measure. In that case each house appoints a committee, and these committees either agree to a single course, or report to their several houses that no agreement can be made. The two houses may meet in joint session for certain specified

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purposes, but never in conference. Between the representatives of nations there have been many important political and commercial conferences, such as those of Vienna in 1820 and 1834, of Paris in 1856, of London in 1864, 1867, and 1871. Of late years, conferences have grown popular. There was an international conference (or congress) at Geneva in 1864, for the organization of the sanitary commission, and at Paris in 1867, on the money question. There have been many ecclesiastical conferences. One was held at Hampton Court palace, at the instance of James I., in Jan., 1604. It was composed of prelates of the church of England and dissenting ministers, the object being to effect a general union. This conference led to the translation of the Bible known to English readers as the authorized version. Another conference was held in 1661, when some alterations were made in the prayer book. Similar conferences were once frequent in the Roman Catholic church; and in other churches there are pastoral and other conferences. The annual meeting of the Wesleyan church of England is called the "Annual Conference;" and the same title is used for annual or other stated sessions in the Methodist Episcopal, the Quaker, the Evangelical, Baptist, and other denominations. Under the name of "Evangelical Church Conference," delegates from the German states and Austria meet for the consideration of questions affecting church matters. See CONFERENCES OF THE METHODIST EPISCOPAL CHURCH.

CONFERENCE, WESLEYAN. See METHODISTS.

CONFERENCES OF THE METHODIST EPISCOPAL CHURCH are five in number: 1. The *Quarterly Conference*, limited to a single pastoral charge (or local church), and having supervision over it. Its members are the pastor, local preachers, exhorters, stewards, and class-leaders, together with the trustees and Sunday-school superintendent, if members of the church. 2. The *District Conference*, embracing the churches of a presiding elder's district, is composed of the pastors, local preachers, exhorters, and one steward and Sunday-school superintendent from each pastoral charge. It has a general supervision of the temporal and spiritual affairs of the district; licenses local preachers, has jurisdiction over them, and recommends them to the annual conference for admission on trial and for orders. 3. The *Annual Conference*, composed wholly of traveling preachers. Possessing no legislative power, its functions are purely administrative. It has the power of discipline over its own members, inquiring annually into the Christian character and ministerial efficiency of each by name. 4. The *Judicial Conference*, instituted for the trial of bishops who may be accused of wrong-doing, and of appeals by convicted members of an annual conference. The annual conferences severally elect seven "triers of appeals." In case of an appeal the triers from three adjacent conferences constitute the judicial conference to which it is referred. For the trial of an accused bishop the triers from five neighboring conferences are necessary. 5. The *General Conference*, the highest judicatory and only legislative body of the church, meets once in four years. It is composed of one minister for every 45 members of each annual conference, and two laymen, chosen by lay electors, from the several quarterly conferences within the same territory. Under certain restrictive rules it has supreme authority, with supervision over all the interests and work of the denomination. It elects the bishops and other general officers. The bishops, who are its presiding officers but not members of it, are subject to its direction and are answerable to it for moral as well as official conduct.

CONFER'VA, a genus of plants of the natural order *algæ*, sub-order *confervaceæ* (or order *confervaceæ*). The plants of this genus consist of simple or branching jointed filaments, which are filled with green—seldom purple or red—matter, and are found in abundance in water—some of them in fresh, and some in salt water—and on moist earth. *C. rivularis*, a species common in brooks, is sometimes 2 to 4 yards in length, and was formerly used as an application to wounds and slight burns. This and other species are sometimes called *crow silk*, and are used in some places for stuffing mattresses. *C. rupestris* often covers whole rocks on the sea-coast. *C. crispa* sometimes forms a close entangled layer on inundated land, and has received the name of *water flannel*. *C. ægagropila*, sometimes called *moor ball*, is found in lakes and ponds, where it floats about freely in the water, its filaments forming an entangled ball, capable of being employed as a pen-wiper.—The name C. is not always strictly limited to the genus, but is extended to many of its near allies. Among the *confervaceæ*—or confervals—however, are included many plants, as the different kinds of laver, which have a flat and not a thread-like frond. Many also consist of cells immersed in a slimy matter. The *confervaceæ* grow by the division and sometimes by the branching of cells; reproduction takes place by *spores*, formed in the interior of the cells, and which at last are discharged through the walls of the mother-cell. The very interesting phenomenon of the conjugation (q.v.) of cells has been observed in them. The spores assume the character of zoospores (q.v.), exhibiting movements which resemble those of animals, before leaving the mother-cell, and retain this character for some time after escaping from it. *Confervaceæ* are found plentifully even in mineral waters. Their great abundance often gives a color to the whole water of tanks, marshes, etc. The Red sea is said to derive its name from the color sometimes given to the surface of its waters, for distances as great as the eye can reach, by small *confervaceæ*. The yeast-plant has been ranked among *confervaceæ*, but is more generally regarded as one of the *fungi*. Other vegetable

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organisms which appear in liquids of the most various kinds, and which have also been ranked among *confervaceæ*, are more probably the *mycelium* of imperfectly developed *fungi*. The plants noticed in the article ALGÆ as appearing in diseased conditions of animals, are regarded as *confervaceæ*.—The lavers are almost the only *confervaceæ* ever used for human food.

CONFESSION, JUDGMENT BY, in England, is judgment against a defendant on his confessing both the facts and law alleged by the plaintiff. An agreement to confess judgment is a common mode of securing money, but is subject to strict technical regulations.

CONFESSION, in law, is the admission of his guilt by an accused person. In England, proof of C. is sufficient to warrant a jury in convicting without more evidence; in Scotland, some corroborating circumstance must be proved. In both countries, however, the C., to be admissible, must have been made without any promise or threat held out to induce it. As to C. on trial, see PLEA; PLEADING; and as to C. before the examining magistrate, see DECLARATION IN CRIMINAL PROCEEDINGS.

Confession in law, is a purely voluntary declaration, made by one who has committed a misdemeanor or a crime, to some other person, of the agency or participation which he had in the offense. Also, the admission of a prisoner that he is guilty of the offense with which he is charged. If made before a magistrate or in the course of judicial proceedings before a court, such confessions are "judicial;" if made anywhere else, they are "extra judicial." An entirely voluntary confession is admissible in evidence; but not so if procured through inducements, threats, promises or hopes, of escape or favor. A confession in answer to questions by a magistrate or by any other person is admissible. A prisoner's confession when the *corpus delicti* is not otherwise proved, is not sufficient to warrant conviction.

CONFESSION, in Roman Catholic theology, means a declaration of sins to a priest in order to obtain absolution. The practice of C. is believed by Roman Catholics to be of divine institution, being founded on the power of binding and loosing from sin conferred on the apostles by Christ (Matt. xvi. 19, xviii. 18, and John xv. 22, 23). The power of binding *or* loosing, being in the view of its advocates judicial and discretionary, presupposes a confession of sins in order to its being judicially exercised. Although some allusions to C. are found in the New Testament, Catholics do not allege any formal scriptural precept for it, but they contend that the above passages contain an implied precept, which they further support by testimonies of the fathers. Though the apostle James recommends that Christians should confess their "faults one to another," yet open and public C. appears to have been first required in cases where persons guilty of gross apostasy desired to be again received into the church. Motives of piety, and a wish to avoid the scandal of open C., led gradually to the institution of private C. in the hearing of a priest. In and after the 5th c., such C. was made an indispensable preparation for receiving the sacrament of the Lord's supper. Open or public C., which was part of the discipline of public penance, ceased when that discipline went into disuse. Private C. has been retained, and though its defenders hold it to have been at all times in use, a general law was enacted by the fourth council of the Lateran (can. xxi., *omnis utriusque sexus*), requiring that every Christian who has attained the years of discretion should confess to a priest approved for the purpose, at least once in the year; and they insist that this law was by no means the origin of the precept of C., but merely defined the time of its fulfillment. C. is one of the three "acts of the penitent"—contrition, confession, and satisfaction—which the council of Trent declares to be parts of the sacrament of penance. The sinner is required to confess each and every mortal sin, in thought, word, and deed, which, after diligent examination of his conscience, has occurred to his memory. He is exhorted, but not required, also to confess venial sins (q.v.), especially if they be habitual. C., in order to be fruitful, must be accompanied by contrition and a purpose of amendment. It commonly embraces the sins committed since the last C.; but may include a longer period, and even the entire life. In the latter case, the C. is called general. It is called "auricular," as being made to the private "ear" of the priest; and is ordinarily spoken, but in cases of necessity may be made in writing, by signs, or even by an interpreter. Priests cannot validly receive confessions in any place without the "approbation" of the bishop of the place, which may be given either absolutely or with restrictions. C. is prescribed in the ritual of the Greek, the Russo-Greek, the Coptic, the Syrian, and the other oriental churches. In most of these churches the practice is obligatory, but in some it has gone into disuse. The Lutheran church professes (according to the 11th art. of the *Augsburg confession*) "that private confession must be retained in the church; but that full and particular statement of *all* sins is not necessary, because, according to Psalm xix.12, it is impossible." In the apology of the Augsburg confession, it is said to be "impious" to abolish the practice of private C. to the priest; but in practice, the Lutheran church has widely departed from these rules. The reformed church (in Germany) has always been more inclined to general C.; and the united church also substitutes for private C. certain devotional exercises previous to communion. The church of England employs a general form of C. and absolution in its morning and evening services, but retains private C. in the rubric for visitation of the sick. The Scotch churches do not recognize it at all.—The *sigillum confessionis* ("seal of confession"), both in the Roman Catholic

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and in the German Protestant church, means the obligation of a confessor or priest not to divulge the secrets of the confessional. This custom of secrecy is traceable in the 4th and 5th c., but was made binding by Innocent III. in the 12th, and its violation by a priest makes him subject to the severest penalties that can be inflicted by the church. See CONFIDENTIALITY.

CONFESSIONAL, the seat or recess in which the priest sits to hear confession in a Roman Catholic church. It is probable that the confessionals in English churches, previous to the reformation, like those still found in Catholic use, were slight wooden erections, because they have so entirely disappeared that their form is a matter of dispute among ecclesiologists. It would seem that confessionals were not always used, as in an old painting on the walls of St. Mary's chapel, Winchester, a woman is represented kneeling to a priest, who is seated in his stall. The confessional commonly has a door in front for the priest to enter by, and an opening on one or both sides, like a small window, with a grating of wire or zinc, for the penitents to speak through.

CONFESSION AND AVOIDANCE, in pleading at common law, in England, is the admission of the allegation of the opposite party, but with the addition of some circumstance which deprives it of legal effect, as, for instance, the admitting that an assault was committed as alleged, but with the assertion that it was committed in self-defense. See PLEADING.

CONFESSION OF FAITH. See CREEDS AND CONFESSIONS.

CONFIDENTIALITY, in law. The most common instance of C. is in the case of those communications between a client and his legal adviser, which neither of them can be called on to produce in a suit, and upon which no action of damages can be founded. The privilege extends to letters written by the lawyer to his client, relating to a suit which is either pending or contemplated; but to what extent it covers other business communications, is a question on which there are conflicting authorities in Scotland. In England, the rule has received a liberal interpretation (Dickson on *Evidence*, p. 930). The same privilege is extended to the communications of several parties, or of their counsel and agents engaged on the same side of a cause, and made with a view to their joint prosecution or defense. Where a party, placed in such circumstances, is examined as a witness, he will be entitled to decline answering questions as to such communings, and even bound to do so, unless the privilege is waived by the other party interested (Dickson, p. 924). The principle on which this privilege rests, as stated by Stephen (*Com.* iii. 466), is that these communications are made "on such lawful occasions as tend to rebut the *primâ facie* inference of malice, which otherwise arises from a statement derogatory to private character." It is on the same principle that a master is protected who, when called upon for the character of a servant, charges him with a theft. In such cases, in order to support an action, there must be proof of malice beyond the uttering of the words. With a view to preserving the freedom of domestic intercourse, and from a belief that the testimony of near relatives in favor of each other was worthless, and that the only effect of examining them against each other was to tempt them to commit perjury, it was formerly the habit to reject them as witnesses. The practice in England, for a long time, however, has been to admit, and even to exact their evidence, making allowance, in appreciating its value, for the circumstances in which they are placed. The same principle has latterly been followed in Scotland; and the only exceptions which have been retained by the law of evidence acts, 15 and 16 Vict. c. 27, 16 and 17 Vict. c. 20, to the now almost universal admissibility of witnesses, are, that neither the parties themselves, nor their husbands or wives, shall be competent or compellable to give evidence in criminal proceedings in which they are accused, nor to answer questions in a civil suit tending to criminate themselves or each other, or to reveal matters which they have communicated to each other during marriage. The C. of such communications remains although the marriage has been dissolved by death or divorce (Dickson, p. 924).

From very early times, so early, it is said, as the 4th and 5th centuries, the "seal of confession" (*sigillum confessionis*) was held to be inviolable, and no priest could be called upon, under any circumstances, to reveal facts which had been confided to him under its sanction. To this the case of treason was an exception, in England, even in Roman Catholic times (Best's *Law of Evidence*, p. 737). In Roman Catholic countries, the privileges of the confessional remain unaltered; and several of the Protestant churches of Germany having sanctioned the practice of confession, the privilege of secrecy has been extended to it, as a necessary consequence, by the civil power. In these states, however, in addition to imposing far lighter penalties upon those clergymen who shall break the seal, the duty of doing so is enforced in all cases in which the confession has reference to a future crime. In England, no special privilege whatever is extended to the Roman Catholic confessional; and the question as to how far a confession made to a clergyman for the purpose of obtaining spiritual comfort and consolation is protected, was long considered doubtful. The rule has, however, been settled for some time that no clergymen of any religious persuasion are entitled to the same privilege as legal advisers; though it has often been advocated as advisable to extend the rule to clergymen, including Roman Catholic priests. In Scotland, however, the point has never been directly or solemnly decided, evidence of the kind in question when not indis-

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pensable for the ends of justice, being generally either withheld or withdrawn (Dickson, ii. p. 988). By a statute of the state of New York, all ministers of the gospel, and priests of every denomination, are forbidden to disclose confessions made to them in their professional character; and a similar statute exists in Missouri. It has been decided in England, that communications to a medical man, even in the strictest professional confidence, are not protected from disclosure (Best, 734); and the same is the case in Scotland (Dickson, ii. p. 940); but a contrary rule has been adopted in several of the states of America (1 Greenl., § 248, note).

CONFIDENT PERSON. See INSOLVENCY.

CONFIRMA'TION, in English law, is where the party having right to land, grants to the party having possession that which is in him.

CONFIRMATION, a Latin word which signifies *strengthening*. In the ancient church, the rite so named was administered immediately after baptism, if the bishop happened to be present at the solemnity, which is still the custom in the Greek and African churches. In the Roman Catholic church, for the last 300 or 400 years, the bishops have interposed a delay of seven years after infant baptism; in the Lutheran church, the rite is usually delayed for from 13 to 16 years; and in the English church, from 14 to 18 years. There is, however, in the latter church no limit to the period. C. may be administered at an earlier period, if a family is about to emigrate; and persons are confirmed up to 60 or 70, if they choose. The ceremony consists in the imposition of hands by the bishop, accompanied by an invocation of the Holy Ghost as the comforter and strengthener. But both in the Lutheran and English churches, the ceremony is made the occasion of requiring from those who have been baptized in infancy, a renewal in their own persons of the baptismal vow made for them by their godfathers and godmothers, who are thereby released from their responsibility. None can partake of the Lord's supper, in these churches, unless they have been confirmed. In the Roman Catholic church, C. is held to be one of the seven sacraments, and in its administration, unction and the sign of the cross are used; and instead of the imposition of hands, the person confirmed receives a little blow on the cheek, to remind him that he must in future suffer affronts for the name of Christ. In the English thirty-nine articles, C. is declared not to be one of the sacraments, and the above ceremonies have been discontinued since the reformation.

CONFISCA'TION, forfeiture of lands or goods to the crown, as part of the punishment for certain crimes. See ESCHEAT.

CONFLICT OF LAWS. On the breaking up of the Roman empire into separate kingdoms, as many systems of jurisprudence, more or less dissimilar, arose, and were administered side by side. But owing to commercial intercourse and inter-marriage, many persons held property in more countries than one; many possessed two nationalities by birth, and more than two—if nationality could be acquired by residence and interest in a foreign state. In such circumstances, it often became an object of the utmost importance to individuals to ascertain, and of the greatest difficulty to lawyers to determine, whether the laws of one state or of another were to govern questions of sale, succession, status, and the like. As no state could vindicate its jurisdiction beyond its own boundaries, without being guilty of an act of aggression, it became absolutely indispensable that certain general rules should be fixed upon in order to prevent the danger of national hostilities on trifling occasions. The elaboration of these rules constituted a new branch of jurisprudence, to which the title of the C. of L. has been given, but which would be more accurately described as the rules for the solution of that conflict. From the partially independent character which belongs to the different states which constitute the American union, the labors of the continental jurists in international jurisprudence have been carefully adapted to the requirements of that country; and it is consequently to America and to continental Europe, rather than to the writers on English law, that we must look for works of importance on this subject. By American writers, the term C. of L. has usually been confined to that branch of the law of nations which treats of the rights and duties of private individuals, and it is consequently synonymous with what elsewhere is called private international law, under which head its various rules will be enumerated in this work. See INTERNATIONAL LAW, PRIVATE; COMITY OF NATIONS. See Story's *Conflict of Laws*.

CONFORMABLE STRA'TA are beds which lie parallel to each other.

CONFORMITY. See DISSENTERS.

CONFRONTÉ, in heraldry, means facing or fronting one another. It is the same as combatant.

CONFU'CIUS, a celebrated Chinese sage, was b. 19th June, 551 B.C., at Shang-ping, near the town of Tséuse, in the petty kingdom of Lu. His own name was Kong, but his disciples called him Kong-fu-tse (i.e. "Kong, the master or teacher"), which the Jesuit missionaries Latinized into Confucius. His mother used to call him Kéiu ("little hillock"), because he had an unusual elevation on the top of his forehead, with which he is often represented. Various prodigies, as in other instances, were, we are told, the

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forerunners of his birth. An illustrious pedigree has also been invented for him by his fond disciples, who derive his origin from Hoang-ti, a mythological monarch of China who flourished more than 2,000 years B.C. His father, Shuh-leang-ho, died when C. was only three years of age, but he was very carefully brought up by his mother, Yan-she, and from his earliest years, displayed an extraordinary love of learning and veneration for the ancient laws of his country. The prudence, rectitude, and philosophic gravity of his conduct while a boy, are also highly extolled by Chinese writers. At the age of 17, he was made an inspector of the corn-marts, and distinguished himself by his industry and energy in repressing fraud, and introducing order and integrity into the whole business. When only 19, C. married, but divorced his wife four years after marriage, that he might have more time for study and the performance of his public duties. C. was next appointed inspector-general of pastures and flocks, and the result of his judicious measures, we are told, was a general improvement in the cultivation of the country and the condition of the people. The death of his mother, which happened in his 23d year, interrupted for a time his administrative functions, and gave occasion to the first solemn and important act of C. as a moral reformer. According to the ancient but then almost forgotten laws of China, children were obliged to resign all public employments on the death of either of their parents; and C., desirous of renewing the observance in his native land of all the practices of venerable antiquity, did not fail to conform to this long neglected enactment. The solemnity and splendor of the burial ceremony with which he honored the remains of his mother (another old custom which had fallen into disuse), struck his fellow-citizens with astonishment, and they determined, for the future, to bury their dead with the ancient honors. Their example was followed by the neighboring states, and the whole nation, except the poorest class, has continued the practice to the present day. C. now came to be looked upon as an authority in regard to the past, and ventured to speak as such. He inculcated the necessity of stated acts of homage and respect towards the dead, either at the grave, or in a part of the dwelling-house consecrated for the purpose. Hence, "the hall of ancestors," and anniversary feasts of the dead, which now distinguish China as a nation. C. did not end here. He shut himself up in his house to pass in solitude the three years of mourning for his mother, the whole of which time he dedicated to philosophical study. We are told that he reflected deeply on the eternal laws of morality, traced them to their source, imbued his mind with a sense of the duties which they impose indiscriminately on all men, and determined to make them the immutable rules of all his actions. Henceforth, his career is only an illustration of his ethical system. He commenced to instruct his countrymen in the precepts of morality, exhibiting in his own person all the virtues he inculcated on others. Gradually his disciples increased, as the practical character of his philosophy became more apparent. After his "years of mourning" and meditation were over, C. traveled through various states, in some of which he was employed as a public reformer. On his return to Lu, his reputation was very great, not less than 500 mandarins being among his followers. In fact, it is to be observed, that generally C.'s disciples were not the young and enthusiastic, but men of middle age, sober, grave, respectable, and occupying important public situations. This fact throws light both on the character and design of his philosophy. It was *ethical*, not *religious*, and aimed exclusively at fitting men for conducting themselves honorably and prudently in this life. C. now divided his scholars into four classes: to the first, he taught morals; to the second, rhetoric; to the third, politics; and to the fourth, the perfection of their style in written compositions. While residing at Lu C. worked industriously in the revision and abridgment of those works which constituted the principal monuments of that ancient literature about which he was always speaking in the language of unbounded reverence.

An unworthy change of magistrates, however, in the kingdom of Lu induced C. to recommence his travels. He first proceeded to Chen, where he was not much appreciated; and afterwards to Tze, where he became one of the king's ministers, but was dismissed after a short time through the intrigues of cunning courtiers. On his return to Lu, he was appointed "governor of the people." For a time, his inflexible virtue awed them into morality, and the delighted monarch conferred the highest dignities on the philosopher; but the arrival of a bevy of beautiful sirens from a neighboring state, which hated the increasing purity of Lu, suddenly overturned the edifice of morality which C. was constructing; and in despair, he again went abroad in search of less vacillating disciples. His later wanderings were very unpropitious; state after state refused to be improved. He was in some instances persecuted; once he was imprisoned, and nearly starved; and finally, seeing no hope of securing the favorable attention of the mass of his countrymen while alive, he returned in extreme poverty to his native state, and spent his last years in the composition of literary works by which posterity at least might be instructed. He died 478 B.C., without having realized his hopes. But immediately after his death, and notwithstanding the general demoralization of his contemporaries, C. began to be venerated, and succeeding ages adorned his name with golden epithets. His family, which has continued to the present day, through more than 70 generations, in the very place where their ancestor lived, is distinguished by various honors and privileges, being the only example of hereditary aristocracy in China, while in every city down to those of the third order there is a temple to his

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honor. The 15th day of the second moon is kept sacred by the Chinese as the anniversary of his death.

The system of C. is, rightly considered, the most faithful expression of the Chinese mind, although it is neither the oldest of the extant Chinese religions, nor that which can claim the greatest number of adherents. We have termed it a *religion*, but it ought rather to be regarded as a system of social and political life built upon a slight foundation of philosophy. It contains no trace of a personal God. There are, indeed, a number of allusions to a certain heavenly agency or power, *Shang-te*, whose outward emblem is *Tien*, or the visible firmament; but this Shang-te, in the opinion of the most enlightened Chinese scholars, is nothing more than a verbal personification of "the ever-present law and order and intelligence, which seem to breathe amid the wonderful activities of physical creation, in the measured circuit of the seasons, in the alternation of light and darkness, in the ebb and flow of tides, and in the harmonious and majestic revolutions of the heavenly bodies." Sometimes, indeed, C. uses language that might seem to imply more than this. In one of the sacred books, Shang-te is depicted as possessing a high measure of intelligence, and exercising some degree of moral government; he punishes the evil, rewards the good, and is honored with sacrifice. Immediately after, however, we are informed that his retinue consists of six Tsong, the mountains, the rivers, and the spirits generally. Elsewhere, the people are enjoined "to contribute with all their power to the worship of Shang-te, of celebrated mountains, of great rivers, and of the 'shin' (spirits) of the four quarters." Hence we are forced to the conclusion, that C. no more believed Shang-te to be a personal being, than he believed the mountains to be such; and that in describing this power as possessed of intelligence, and as exercising a moral government, he simply spoke in a pictorial and symbolic way of the laws that govern all things. Perhaps, too, a dim consciousness of a mysterious inexplicable *life* pervading the phenomena and operating through the laws of nature—a feeling probably absent from no human soul—influenced C. to use words which his understanding would not have interpreted in a very literal manner. His highest conception of God, therefore, only reminds one of the *anima mundi* of the classical philosophy; and even this conception is not always present. More than once, his language indicates doubt as to the existence of this great abstraction, and he occasionally "reprimanded his disciples for prying into matters unconnected with their duties and lying far beyond their depth." In fact, from metaphysics and theology he equally shrank. The idea of a creation out of nothing by an infinite and eternal person, to the end that the glory of his perfections might be seen and felt through the magnificence of material symbols by those intelligences whom in his beneficent condescension he had deigned to create, is utterly unknown to Confucius. He looked on the universe rather as a stupendous, self-sustaining mechanism. He thought that all things existed from eternity, and were subject to a flux and reflux, in obedience to initial laws impressed upon them, how and why, we know not, by some stern necessity. Thus, chaining to the earth, as it were, "those thoughts that wander through eternity;" crushing, in fact, every spiritual tendency of human nature, by repudiating all speculation, and well-nigh all philosophic investigation of every kind, C. strove to direct the attention of men to the duties of social and political life. "I teach you nothing," he says, "but what you might learn yourselves—viz., the observance of the three fundamental laws of relation between sovereign and subject, father and child, husband and wife; and the five capital virtues—universal charity, impartial justice, conformity to ceremonies and established usages, rectitude of heart and mind, and pure sincerity." This, in fact, contains the whole doctrine of C.; and it was unquestionably well suited to the prosaic, practical, and conservative mind of the Chinese. It was by the strict and faithful performance of appointed duties, and by the cultivation of proper feelings and sentiments, that C. believed wisdom or knowledge could alone be obtained. He seems to have entertained no doubt that the great virtues of charity, justice, and sincerity might be developed without the help of any spiritual or religious faith, by a species of mechanical discipline. They were natural to the mind, he thought, just as their opposites were unnatural. Here, again, we find a striking example of that easily satisfied unphilosophic *materialism* which characterized C., and has since leavened the Chinese nation so thoroughly. He virtually says: "Just as I am forced to accept the phenomena of the universe as *facts*, though I can give no explanation of their origin, so am I forced to accept the phenomena of the human mind as *facts*, though I can give no explanation of *their* origin." C. finds evil and good, wisdom and folly, in the hearts of men. He cannot help making this distinction; some things are bad, others good; such is the oracular utterance of his conscience, which he terms "the light of intelligence." He does not, however, advance a step further, and make this moral conviction the basis of a religion. His "good" has no connection with any God. It exists; we are forced to recognize it as such; that is all we can know. Cultivate it. Those great laws of nature about which we know nothing except that they are realities, are on its side. Do not foster what you know to be mean and unworthy, for "he who offends against heaven has no one to whom he can pray." "Imperial heaven will only assist virtue." From this stand-point, C. taught a simple and comprehensive rule of life, both private and public. First, let every man govern himself according to the sacred maxims; then his family according to the same; and finally, let him render to the emperor, who is the father of his people.

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such filial obedience as he demands of his own children, and worship him with the same veneration as he does his own ancestors; for thus will domestic peace, social order, and the safety of the commonwealth be preserved. To further this end (and in accordance with his belief that by instruction in the sacred precepts everything desirable could be accomplished), C. inculcated the necessity of universal education, and, in consequence, schools are diffused throughout the length and breadth of the empire, penetrating even to the remotest villages, where the maxims of the philosopher are taught, whose influence is thus perpetuated from generation to generation.

Confucianism appeals to "practical" men. It lauds the present world; rather doubts, than otherwise, the existence of a future one; and calls upon all to cultivate such virtues as are seemly in citizens—industry, modesty, sobriety, gravity, decorum, and thoughtfulness. It also counsels men to take part in whatever religious services have been established from of old. "There may be some meaning in them, and they may affect your welfare in a way you do not know of. As for the genii and spirits, sacrifice to them: I have nothing to tell regarding them, whether they exist or not; but their worship is part of an august and awful ceremonial, which a wise man will not neglect or despise." Confucianism, in consequence, almost immediately after the death of its author, became the religion of the state, to which it has proved an admirable ally; its theory of government being nothing less than a paternal despotism. The entire literary class in China are also followers of C., and, in fact, for many ages the literature of China has consisted exclusively of commentaries on the five canonical books which C. professed to merely abridge, and of four others, which were composed partly by himself and partly by his disciples, and which, together with the former, constitute the nine Chinese classics.

The five canonical books are the *Yih-king*—originally a cosmological essay, now, curiously enough, regarded as a treatise on ethics; the *Shu-king*—a history of the deliberations between the emperors Yaou and Shun, and other personages, called by C. the *ancient kings*, and for whose maxims and actions he had the highest veneration; the *Shi-king*—a book of sacred songs, consisting of 311 poems, the best of which every well-educated Chinaman gets by heart; the *Le-king*—the book of rites, the foundation of Chinese manners, prescribing, as it does, the ceremonies to be observed in all the relationships of life, and the great cause of the unchangeableness and artificiality of Chinese habits; and the *Chun-tsien*—a history by C. of his own times, and those which immediately preceded him. The first of the "Four Books" is the *Ta-hëo*, or "Great Study," a political work, in which every kind of government, from the domestic to the imperial, is shown to be essentially the same—viz., parental; the second is *Chung-yung*, or "the Invariable in the Mean," a book devoted to teaching men what is "the due medium," or the golden mean, to observe in their conduct; the third is the *Tun-yu*, or "Philosophical Dialogues," containing the recorded conversations of C., and the best book for obtaining a correct knowledge of his character; and the fourth is the *Hi-tse*, written by Meng-tse, or Mencius, who died 317 B.C., and who was by far the greatest of the early Confucians. The main object of this work is to inculcate philanthropic government.

It is proper to observe, in conclusion, that in the course of centuries the defects of the system of C. made themselves felt even to the unspiritual Chinese mind; and the necessity of "speaking out far more plainly, not on matters of finance, economy, and etiquette, but on the nature of the world and its inhabitants, and the true relation of the seen and temporal to the absolute and the all-embracing, was recognized. The philosopher who guided this great movement to a prosperous close was Tehu-he (d. 1200 A.D.), is termed by European scholars the Chinese Aristotle, and regarded by all the governing class in China as "the prince of science." His innumerable works are laboriously studied by the higher literary class, and are considered the standard of metaphysical or religious orthodoxy, but the mass of ordinary Confucians never pass beyond the ceremonial ethics of their master.

For further information regarding Confucius, see CHINESE EMPIRE; Legge's *Life and Teachings of C.* (1867); Douglas's *Confucianism and Taouism* (1880).

CONGAREE RIVER, in South Carolina, formed by the junction of the Broad and the Saluda about the middle of the state. After a course of 50 m. it unites with the Wateree, after which the two are called the Santee. The Congaree is therefore only 50 m. long. It is navigable for steamboats.

CONGÉ D'ÉLIRE (Norman-French), the name given in England to the king's warrant or permission to a dean and chapter to proceed to the election of a bishop to a vacant see. Since the passing of the statute 25 Henry VIII. c. 20, the C. d'É. has always been accompanied by a letter-missive from the king, mentioning the person to be elected by name, so that in reality it is a nomination by the crown. If the dean and chapter delay the election beyond twelve days, the nomination is effected by letters-patent from the crown; if they delay beyond twenty days, or elect another than the person named, they incur the penalties of a *præmunire*, i.e., loss of civil rights, forfeiture of their goods, and imprisonment during the royal pleasure.—Stephen's *Commentaries*, vol. iii. p. 8.

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CONGENITAL DISEASES are such diseases as are acquired during the period of pregnancy. They are hereditary and non-hereditary. Among those which are hereditary are syphilis and some chronic skin diseases; and they may be inherited from either parent. Among the non-hereditary are congenital hernia and hydrocephalus.

CONGER, or CONGER-EEL, *Conger*, a genus of marine fishes of the eel family (*muræntdæ*), having the tail more elongated and pointed than the fresh-water eels, the dorsal fin commencing much nearer the head, and the teeth of the upper jaw, although slender, placed so close together as to form a cutting edge. The species are not numerous. The only British species, *C. vulgaris*, sometimes attains a length of 5 or 6 ft.

CONGER, OMAR D., b. N. Y., 1818; graduated at Western Reserve coll., Ohio, 1842; was elected judge of the St. Clair county court, Mich., 1850; senator in Mich. legislature, 1855–59; was elected to the XLIst and six succeeding congresses; was elected to the U. S. senate as a republican, 1881.

CONGESTION may be defined to be "excess of blood in the vessels of a part, with diminished motion of that blood." The chief causes of congestion may be classed under the two heads of (1) congestion from venous obstruction, and (2) congestion from want of tone in the vessels.

1. *Congestion from venous obstruction* is easily illustrated by tying up the arm, as is done before opening a vein, when the veins are compressed more than the arteries. If the ligature is kept on for a sufficient time, the veins swell, the fingers become red, and then livid, and the whole limb is swollen. Cold applied to the surface of the body acts similarly on it, and contracts the veins more rapidly than the arteries, which lie deeper; and the purple color of the hands and face after exposure to cold shows the congested state of the capillaries. "Congestions," says Dr. C. J. B. Williams, "are caused in external organs by an obstruction of the veins leading from them. Thus, congestion of the brain may be produced by a tight cravat or by a tumor pressing on the jugular veins. Efforts of straining, coughing, holding the breath, and asthmatic paroxysms which impede the flow of blood through the lungs, cause congestion in various parts. Tubercles in the lungs cause congestion of that organ. Obstruction to the transit of blood through the liver causes congestion in the abdomen, hemorrhoids, etc."

2. *Congestion from want of tone in the vessels* includes a numerous class of cases. In atony of the vessels generally, as in extreme debility, certain fevers, etc., there is general congestion of the parenchymatous organs—the lungs, liver, etc.—and the blood gravitates to the lowest parts, giving rise to what is termed *hypostatic* congestion of the posterior parts of the lungs, the skin of the back, etc. In other cases, the weakness is local, as when the feet swell after long standing, in consequence of over-distention of the veins. Similarly, a continued stooping posture may occasion headache, giddiness, and the other symptoms of congestion of the brain. Congestive affections of this kind are often mistaken for inflammation, and instead of being treated by tonics, are treated by depletion, which, although affording temporary relief, increases the evil.

Another cause of congestion is over-excitement of the vessels, and this often occurs at an early stage of inflammation, or as a result of that process.

We must pass over the symptoms and effects of congestion, because they vary very much according to the organ affected, and shall conclude with a few words on the general remedies for congestion. First in order, we must notice such as remove the cause, as the loosening of a ligature, or the removal of a tumor compressing veins, elevation of the head in affected brain, and the recumbent position in congestion of the hemorrhoidal or uterine vessels. Pressure, by supporting the weak vessels, and friction, by increasing the onward movement of the blood in the veins, are often of great use. Astringents, such as solutions of alum, sulphate of zinc, tannin, oak-bark, etc., may be applied with advantage locally to certain parts, as the eye, throat, rectum, etc.; and stimulants may be similarly used, as a capsicum gargle to a relaxed sore-throat. Medicines of these classes may also be given internally. Thus, the principal action of bark, quinine, and arsenic in the cure of ague is supposed to lie in their reducing the great visceral congestion that is always present. The American witch hazel (q.v.) when administered internally seems to have the power of diminishing the size of dilated veins, and is sometimes useful in varicose veins, hemorrhoids, etc. Various remedies are supposed to have a special power of removing the congestion of certain organs: thus, mercurials are recommended for congestion of the liver; digitalis and cantharides for congestion of the kidneys; and squills, benzoin, and the balsams for bronchial congestion.

CONGLETON, HENRY BROOKE PARNELL, Lord, 1776–1842; son of John Parnell, chancellor of the Irish exchequer, and a descendant of Parnell the poet. For 35 years he represented Queen's co., Ireland, and Dundee, Scotland, in the English parliament. In 1841 he was made baron Congleton. He is the author of the *Principles of Currency and Exchange; The Penal Laws against Irish Catholics*, etc.

CONGLOMERATE, or PLUM-PUDDING STONE, a rock consisting of round, water-worn pebbles, compacted together into stone. These pebbles consist of portions of hard rock, frequently of quartz. They can sometimes be traced to their parent rock. Their rubbing and polishing must have been a work of considerable time, but their deposition in the beds in which they occur has been performed speedily, the materials having been brought together by a strong current. They are united together by a silicious, calcare-

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ous or ferruginous cement, sometimes so loosely that they are easily separated by a slight blow from a hammer.

CONGO FREE STATE, recognized by the European powers assembled at the conference of Berlin in 1885 (see AFRICAN INTERNATIONAL ASSOCIATION), has the following boundaries: The northern bank from the mouth of the Congo, with a strip of territory averaging about 60 m. in width, as far as Manyanga, situated about 240 m. from Banana, the entrance port of the river. At Manyanga the French territory commences and continues along the n. bank, passing Stanley Pool as far as the Mobangi. The territory of the C. F. S. recommences at this river and runs from its mouth northward to its junction with the Boma river, thence n.e. to the water-shed of the Congo basin and eastward to 30° e. long. and Lake Tanganyika, s.e. to Lake Bangweolo and the southern water-shed of the Congo basin to Lake Dilolo, thence s.w. to the course of the Kassai river, which separates it on the s.w. from Angola. In the south it extends to 7° s., the river Kwilu, 8° s., the river Kwango, and the parallel of Nokki.

The climate is purely tropical, the average temperature ranging between 78° and 82°. Malarial fevers, especially on the coast, are not infrequent; but the interior is more healthful. The principal products are ivory, palm-oil, rubber, various gums, ground-nuts, camwood, beeswax, orchilla, etc. On the upper river, coffee, tobacco, rice, and various kinds of maize and sorghum are cultivated. Bananas, pineapples, mangoes and other tropical fruits abound. Gold, copper, and other metals have been discovered. The principal articles of export are palm-oil, rubber, ivory, orchilla, wheat, gum, copal, ground-nuts, and camwood. Coffee is also exported to some extent, being produced especially in the coffee plantations on the upper Congo. The government has some plantations of tobacco, which is also grown in the native villages. The trade has been for the most part with Belgium and the Netherlands.

The inhabitants of the Congo basin belong to what is called the Bantu race. They are a happy, inoffensive people, not so dark as the Fan or Ethiopian, are split up into numberless tribal communities, and as they are born traders, they take very readily to commerce. The population was officially estimated (1896) at 30,000,000. Their numerous dialects appear to have a common origin (see BANTU). The religion is mainly fetichism. At an international conference, held at Brussels in 1890, authority was given to the government of the Free State to levy certain duties on imports. It was placed under the sovereignty of the king of the Belgians, but by his will of August 2, 1889, he bequeathed to Belgium all his sovereign rights in Congo. By a convention between Belgium and the C. F. S. the right of annexation was reserved to Belgium after the year 1900. The year 1892 saw the downfall of the Arab in the district called Kasongo or Manyema, where the notorious slave-trader Tippu Tib had had matters in his own hands for many years. (See Hinde, *Fall of the Congo Arabs*, 1897). In 1894 France made an agreement with the government of the C. F. S., fixing definitely the boundary between the latter country and French Congo. By this, France received the "right of police" along the left bank and over the course of the Mbomu. In 1895 the Belgian government recognized the French "right of pre-emption over the Belgian possessions on the Congo, in case of their alienation by sale or exchange, in whole or in part." The year 1896 saw great activity in railway construction, the Belgian chamber of deputies having provided for an immediate loan in aid of the Congo railway, and guaranteed a further loan. In the same year complaints of cruelty toward the natives, on the part of the Belgian officers and men, led to the establishment of a commission, by King Leopold, for the protection of the natives. The central government is at Brussels and consists of the king of the Belgians and the departments of foreign affairs, finance, and the interior. The local government consists of a governor-general and other executive officers, together with a commander of the forces. In each district the governor-general is represented by a commissioner, assisted by civil and military officials. Boma is the seat of the government. The state has a coinage and postal service, and belongs to the postal union. In 1888 a survey was made for a railroad between Matadi and Leopoldville, and in 1896, 115 miles were open for traffic. In 1896 the finances of the Congo state showed a deficit of over 1,230,000 francs. See illus. AFRICA, vol. I.

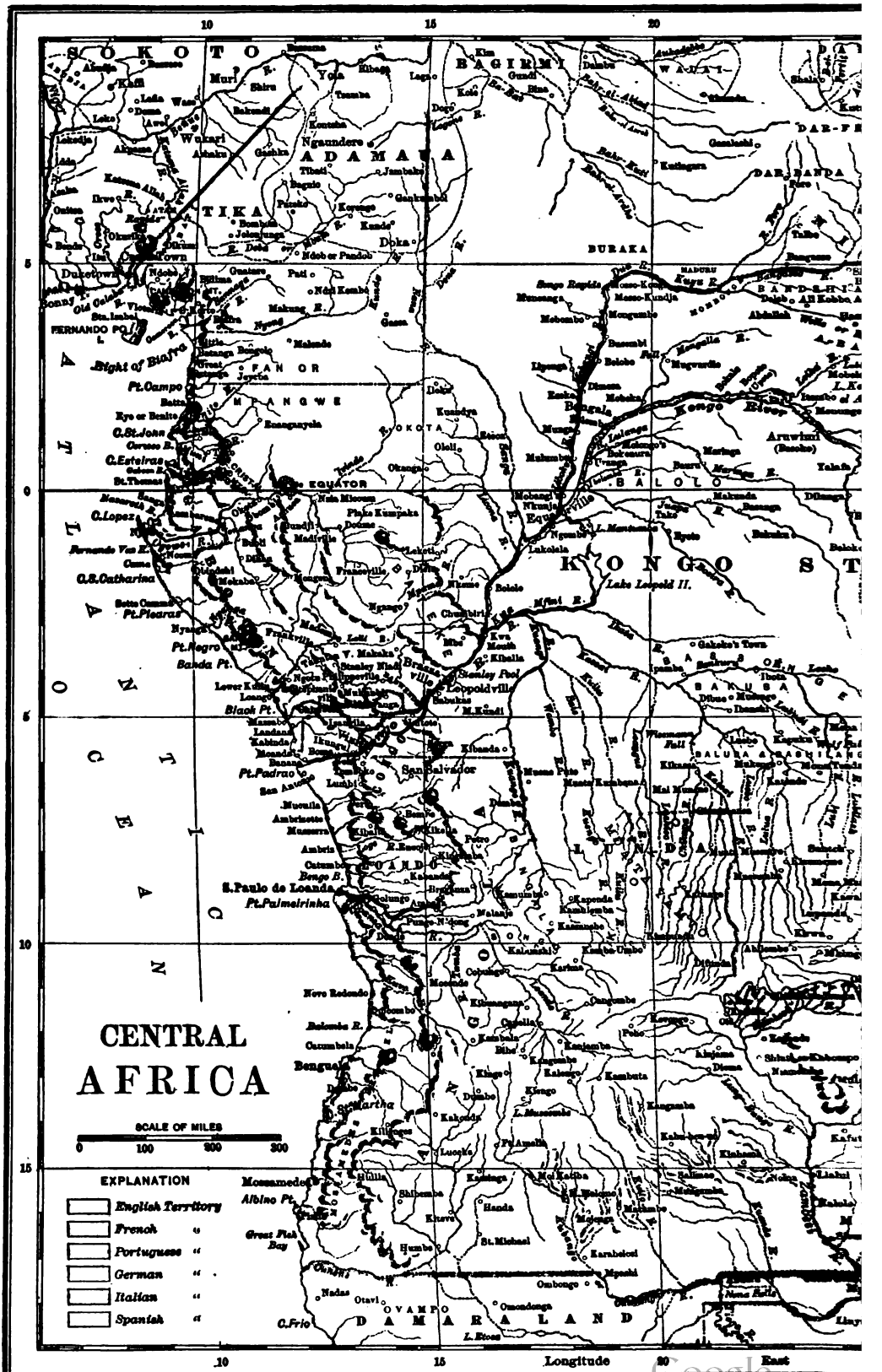
CONGO, the great river of equatorial Africa, and the second largest river in the world, rises in lake Bangweolo, noticed by Lacerda in 1795 and other earlier Portuguese explorers, of which the Chambezi, traced by Livingstone, is the largest feeder, and into which also flow numerous streams from the Lokinga mountains on the s., is the reservoir from which this river issues under the name of the Luapula. Flowing in a northerly direction, it expands into lake Moero, on leaving which it is called, as far as Nyangwe, the Lualaba; from Nyangwe to Stanley Falls (Arab, Zingatini) it is called the Livingstone; and from Stanley Falls to its mouth it is called the C. Its length is estimated at 2800 miles, and the area drained at more than 1,000,000 sq. m. Between Stanley Pool and Stanley Falls it is navigable (990 m.). Its force and power are so great that no delta exists at its mouth, and during the rainy season discolored water and débris are carried more than 300 m. from land. Its largest tributaries are the Kassai, Kwa or Kwango, Juapa, Bosira, Ikelemba, Lulongo, and Lumami rivers on the s. or left bank, and the Mobangi or Welle, Aruwimi, Mbura, Loika, Ngala, Lokinga, Nkundji, etc., on the n. or right bank. The length of navigable water-ways afforded by the C. and its tributaries has been calculated at 5800 m. See AFRICA.

CONGOON', or KONGUN, a t. of Persia, on the gulf, 130 m. s. of Shiraz. Pop. 6000.

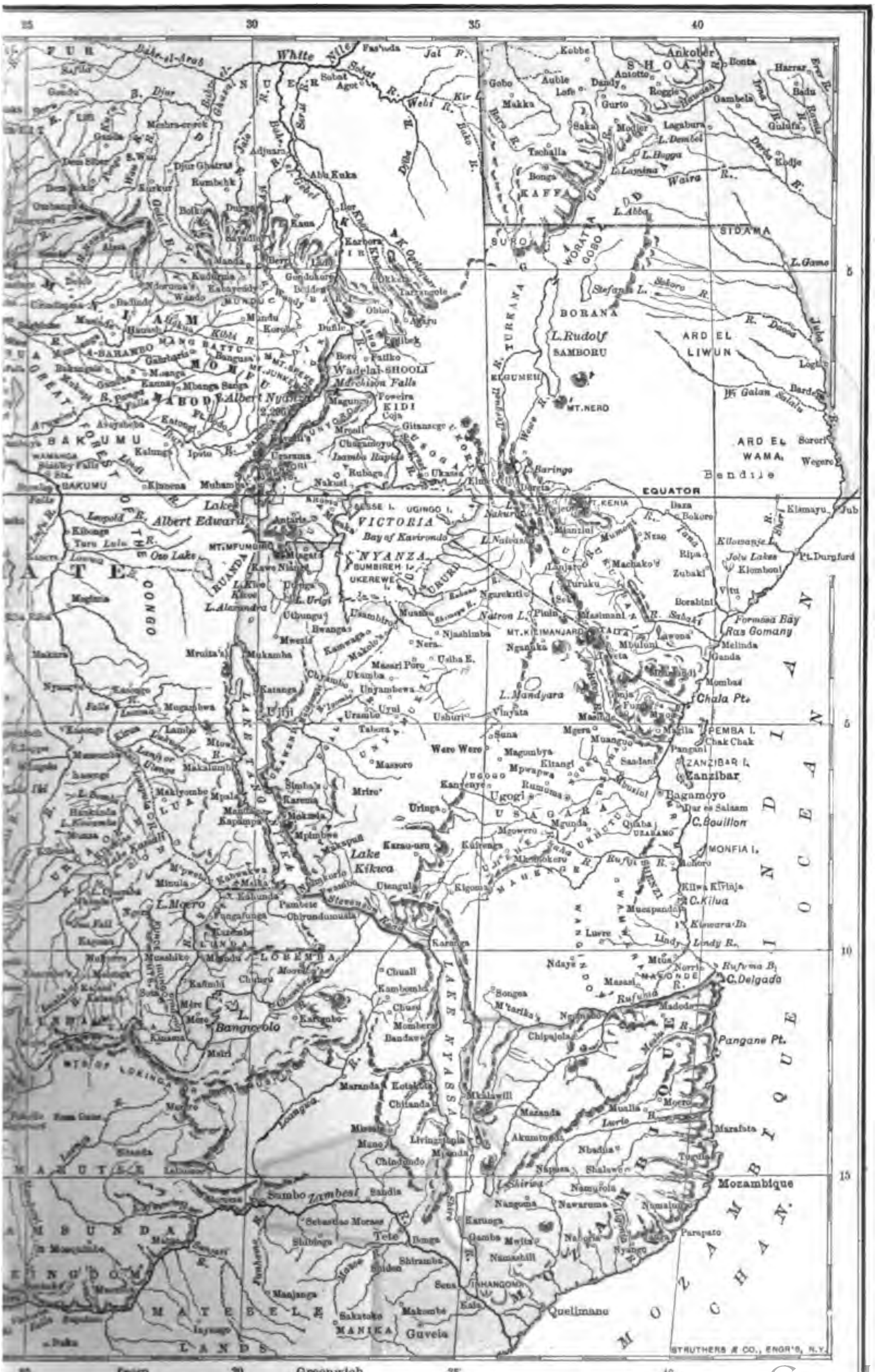
CONGO SNAKE. See AMPHIUMA.

CONGREGATION (Lat. *con*, together; *grex*, a flock), an assembly, generally a religious assembly; in its most ordinary use, an assembly of Christians met in one place for wor-

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ship. See CHURCH.—In the Roman Catholic church, it often designates a sort of board of cardinals, prelates, and divines, to which is intrusted the management of some important branch of the affairs of the church. Thus the *C. of the Index* examines books and decides on their fitness for general perusal. See INDEX. The *C. De Propaganda Fide* consults as to the advancement of the Roman Catholic religion throughout the world. See PROPAGANDA. The *C. of Relics* inquires into the genuineness of supposed relics. The *C. of the Holy Office* takes cognizance of heresies, etc. See INQUISITION. The *C. of Rites* regulates the festivals and offices of new saints. There are numerous other congregations.

CONGREGATIONALISM (see INDEPENDENTS), is a form of church polity according to which any congregation of believers, associated for Christian worship and work, mutual edification, and the maintenance of Christian ordinances, is a church of Christ, subject to no ecclesiastical authority, though bound by the law of Christ to be in fellowship especially with neighboring churches and generally with the whole body of believers. This system recognizes no church as statedly organized on any field wider than that of the local community. If in the administration of its affairs the interests of other churches seem involved, or if it have vainly sought to settle serious difficulties within itself, it seeks the advice of neighboring churches in a council; but it is not bound to follow such advice against its own deliberate and conscientious conviction of Christian duty. The cases are, however, very rare in which the decision of a council is not found to be practically self-enforcing by moral pressure. A member whose rights are invaded by the action of the church, may request the church to join with him in calling a council to consider the case; if his request be disregarded, he may call an *ex parte* council. A council is always limited strictly by the letter-missive which convenes it. That is its charter, and it has no functions as to any case or question not distinctly specified therein. Each Congregational church frames or adopts its summary of doctrines, in accordance with its own interpretation of the Scriptures, elects its own pastor and other officers, admits or rejects candidates for its membership, admonishes and rebukes offenders, and withdraws fellowship from them if they prove incorrigible. Every male member of full age has the right to vote in church affairs, and in some churches the right for women and minors to vote is admitted. The officers of a church are a pastor (usually the moderator in church meetings), and deacons in number as may be needed. A clerk, a treasurer, and needful committees may be appointed. The deacons serve at the communion table, care for the needy members, and are expected to aid the pastor in watching over all the interests of the brotherhood. In theory, their office involves the charge of the temporalities of the church, but practically their duties in this regard are in the hands of a board of trustees appointed by the "society," which provides for all the temporal affairs of the church. The deacons are elected sometimes for life, and sometimes for a period of time. The church has power to ordain its own minister if it see necessity so to do, but this is almost universally avoided as an irregularity, and when a pastor has been elected, his ordination is by a council of neighboring churches called for this purpose, and present by their pastors and delegates. The council examines the candidate as to his moral, spiritual, and intellectual qualifications, and, if it find him worthy, ordains or installs him by such religious services as to it may seem fit. These services usually embrace a sermon, a prayer of ordination, with laying on of hands, a charge to the pastor, with the right-hand of fellowship, and an address to the church and congregation. It occasionally happens that a council called to aid in the settlement of a minister fails to be satisfied with his fitness, and therefore declines to act in inducting him into office. In such cases the church, in its discretion, either relinquishes the candidate, or (very rarely), continuing him in the pulpit, takes upon itself the responsibility for whatever may be the effect of its action upon its standing and fellowship with other churches. A national council, meeting triennially for discussion, has been held since 1871. An International Council was held in London in 1891.

Congregationalism, like every other church polity, may be associated with any form of theological doctrine. The Baptist, Unitarian, Universalist, and some other denominations adopt the polity, though they do not take the name. The "Congregationalists" so called, and bearing this as their distinctive title, are clearly evangelical, and are deemed Calvinistic, though scarcely so except in a sense somewhat modified by modern thought. Their ecclesiastical polity, whose central principle is the independence of the local church under the law of Christ alone, tends to make subordinate questions of mere form or method, to keep open the path of free inquiry, and to foster the spirit of progress; while the moral influence of the great body of churches voluntarily associated in religious fellowship and for co-operation in Christian work, operates as a check, all the more powerful because unostentatious, upon hasty and ill-considered divergences from the old paths. A creed has been set forth recently, but only as suggestion, not as authority.

It is claimed by Congregationalists that their system of government is in complete accord with that of the apostolic age, and conformed to the genius and spirit of Christianity; but they do not trace it in direct historical line further back than the period of the Protestant reformation. Their theory is that Congregationalism is a return to the primitive order which had been rejected for the ecclesiasticism of Rome or of great national churches. John Robinson is generally regarded as the father of the system as revived in modern times, though doubtless he was only one of many founders. He was

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prominent among those who sought refuge in Holland from the persecutions of the church of England. Settling first in Amsterdam in 1608, he and his little flock afterwards removed to Leyden, where, with constant longings for their native land, they tasted the sweets of religious liberty. Seeing no prospect that the persecution in England would cease in their time, and finding their situation not altogether pleasant among a people whose language and habits were different from their own, a large portion of the little company concluded to seek a permanent home in the wilderness of America. Having come to this resolution, they organized themselves as a church, and, with the blessing of their pastor, who expected to follow them at a later date, embarked on the *Mayflower* at Delft Haven in 1620. The little colony landed in Plymouth, on the coast of Massachusetts, where they laid the foundations of a church and state joined together after the pattern of the Jewish theocracy, and it was not until after the colonies became independent of England that the ties which bound the two were wholly severed. Robinson died before he could join the colony. The Plymouth church, formed in Holland, was the first in New England. The first church ever organized in New England was gathered at Salem, Mass., Aug. 6, 1629. The colonies of Massachusetts Bay, Connecticut, and New Haven were mainly composed, not of "Independents" like the Plymouth settlers, but of "Non-conformists," who did not at first contemplate a severance of their connection with the church of England, but sought chiefly the reform of that church in certain practices by them deemed idolatrous and popish. But the free air of the new world created in them a thirst for wider liberty, and the religious life of New England externally considered was soon molded to the form of Congregationalism. The idea of complete religious liberty, as now understood, was then hardly known in the world, certainly not accepted by any large party, and Congregationalism, wielding the civil authority, assumed for itself rights which it refused to dissenters. Thence the history of the colonial period of New England is not free from the stain of persecutions which no one at this day seeks to justify. Episcopalians, Baptists, Quakers, and others, felt the strong hand of civil and social proscription. The spirit of freedom, however, was even then working in the minds and hearts of many thoughtful men, and slowly preparing the way for the complete liberty of religious belief and worship which is now the glory of the republic. The whole spirit and tendency of Congregationalism is universally admitted to be at war with persecution in all its forms.

Congregationalists hold to no order in the ministry higher than that of the pastor of a local church. Religious fellowship among them finds expression in conferences formed of a number of churches in a given neighborhood, and meeting at stated times for worship, mutual edification, and the promotion of missionary and benevolent work; in state associations or conferences composed of ministers and laymen delegated by the smaller conferences, and meeting annually; and, finally, of late, in a national council, meeting once in three years—an addition to the system favored by many, but gravely distrusted by some. None of these bodies have the least ecclesiastical authority or power. In the Congregational system, the society or parish, composed of the pew-holders and worshipers, whether members of the church or not, acts concurrently with the church in the settlement and dismissal of a pastor, and elects the trustees in whom the law vests the management of the church property.

The forms of worship in Congregational churches are usually simple, varying, however, according to the taste of the pastor or the preferences of the congregation. There is general similarity, but no binding rule as to the parts or the order of service. Of late years the practice of responsive reading of selections from the Psalms, and of reciting in unison the Lord's prayer, is gaining favor. The ordinances observed are baptism and the Lord's supper. Infant baptism is generally practiced, but not strictly enforced. Persons baptized in infancy are admitted to the church like others with a public confession of Christ. The officiating minister, before the administration of the Lord's supper, usually invites other than members of the local church to partake, expressing such invitation not in any prescribed form, but in terms more or less strict according to his own views or those of the church. In most instances the invitation is confined to members of evangelical churches, or churches of Christ in good and regular standing; in others it is so broad as to include all who love and follow Christ, whether members of a church or not. Differences like this illustrate the freedom and elasticity of Congregationalism.

Until about the year 1850, Congregationalism was mainly confined to New England, making small effort for its own extension in the region beyond, and freely giving its force to the building up of other denominations; but it has since made large advances in the states of the northwest, west, and south, and is represented in nearly every state and territory. In 1896 the *Year Book* reported 4,825 churches, with 615,195 members (communicants), 26,536 baptisms during the year, 417,485 families, 687,575 Sunday-school scholars, 5,405 ministers, $2,452,537 in benevolent contributions, and home expenditures of $6,871,128. The national societies of the Congregationalists are the American Board of Commissioners for Foreign Missions, the Congregational Home Missionary Society, American Missionary Association, American Congregational Association, Congregational Publishing Society, Congregational Education Society, Congregational Church Building Society, Woman's Board of Missions, and Woman's Home Missionary

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Association. In 1897 there were seven theological seminaries under Congregational control, with an aggregate of 486 undergraduate students, 22 graduate students, 64 professors, and 49 instructors, lecturers and fellows. The Congregational churches have always been noted for their high standard of ministerial education, and, during the present century, for their earnestness and liberality in the work of missions among the heathen, and among the Indians, Mormons, foreigners, and unchristianized natives at home. See works by G. Punchard, H. M. Dexter, A. H. Ross, and the C. *Year Book.*

CONGREGATIONAL METHODIST CHURCH, THE, was formed in May, 1852, in Monroe co., Ga., by ministers and laymen who had withdrawn from the Methodist Episcopal church south, and wished to establish a church with Methodistic doctrines, but giving the people a voice in their own government. In 1852 the first district conference was held and a Book of Discipline adopted; in 1855 the first general convention was held. Since 1881 many churches have joined the Congregational body, but in 1894–5 the Congregational Methodists reported 150 churches and 12,150 members.

CONGRESS, an assembly either of sovereign princes, or of the delegated representatives of sovereign states, for the purpose of considering matters of international interest. Even in America, though the term has now a different meaning (see UNITED STATES), it had a similar origin, the first C. being that of the delegates from the various British colonies, who met on the 7th Oct., 1765, for the purpose of considering their grievances. In like manner, in Belgium, on the 4th Oct., 1830, a C. of deputies from the different provinces was held for the purpose of adjusting the new constitution. Previous to signing a treaty of peace, a meeting of plenipotentiaries usually takes place, to which the name of a C. is sometimes applied, though it seems more properly to be reserved for those more important meetings at which extensive schemes of future policy are determined on, and the balance of power amongst the various European states readjusted. To this class belonged the famous C. of Vienna in 1815; the C. of Carlsbad in 1819, for regulating the affairs of Germany; the Paris C. at the termination of the Russian war of 1854–56; the memorable C. at Berlin after the Russo-Turkish war of 1877–78; and many others. As the envoys to a C. are not sent to one sovereign in particular, a modification of the ceremonial recognized by the law of nations for the recognition of ambassadors takes place. There is scarcely any difference between a C. and a diplomatic conference —such, for example, as that of London in 1826, for determining the fate of Greece. An international American C., to discuss industrial and commercial questions, was held at Washington, Oct. 1889–Apr. 1890.

CONGRESS, UNITED STATES, the only legislative body of the nation, is composed of two houses: the senate, having two members from each state; and the house of representatives, having a membership based on population (see APPORTIONMENT BILLS), though every state must have at least one member. Senators are chosen by the state legislatures, the two houses of a legislature holding a joint meeting or jointly voting on the same day; elections are by ballot; senators must be at least 30 years of age on taking their seats, and their term of office is six years. There being now (1895) 44 states, there are 88 senators. They are paid $5,000 a year with a small allowance for stationery and mileage. The vice-president of the United States is the presiding officer of the senate, but he has no vote except in the case of a tie. The senate has equal power with the house in legislation, except that bills for revenue purposes must originate in the latter body. The senate has the sole power of trying impeachments. When the president is impeached, the chief-justice of the United States supreme court must preside, and the vote of two thirds of the senators present is requisite to a verdict of conviction. The house of representatives consisted from 1873 to 1883 of 293 members, as follows: From New York 33, Pennsylvania 27, Ohio 20, Illinois 19, Indiana and Missouri 13 each, Massachusetts 11, Kentucky and Tennessee 10 each; Georgia, Iowa, Michigan, and Virginia, 9 each; Alabama, North Carolina, and Wisconsin, 8 each; New Jersey 7; Louisiana, Maryland, Mississippi, and Texas, 6 each; Maine and South Carolina, 5 each; Arkansas, California, and Connecticut, 4 each; Kansas, Minnesota, Vermont, West Virginia, and New Hampshire, 3 each; Florida and Rhode Island, 2 each; Colorado, Delaware, Nebraska, Nevada, and Oregon, 1 each. The apportionments of 1883 and 1891 changed these figures as shown below. Many of the states w. of Ohio received a very large increase, while the southern states gained slightly, or remained unchanged. Maine, New Hampshire, and Vermont lost. Members of the house are chosen in separate districts by popular vote, and their term is two years. The house elects one of its number to be speaker, or presiding officer. The course of legislation need not be explained. In case of a veto by the president, it requires a two-thirds vote in each house to re-enact the bill. Members of the house must be at least 25 years old. They are paid the same as senators. The whole number of members of the house has been regulated by the decennial apportionments as follows: In 1789, 65 members; in 1793, 105; 1803, 141; 1813, 181; 1823, 213; 1833, 240; 1843, 223; 1853, 237; 1863, 243; 1873, 293; 1883, 325; 1891, 356. Under the first apportionment there was one member to 30,000 citizens; under the last, one member to 173,901. The apportionment of representatives according to the census of 1890, and the gain or loss in the case of each state as compared with the apportionment of 1883, is shown by the following table:

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States	Population.	1891.	1883.	States.	Population.	1891.	1883.
Alabama	1,513,017	9	8	Montana	132,159	1	1
Arkansas	1,128,179	6	5	Nebraska	1,058,910	6	3
California	1,208,130	7	6	Nevada	45,761	1	1
Colorado	412,198	2	1	New Hampshire	376,530	2	2
Connecticut	746,258	4	4	New Jersey	1,444,933	8	7
Delaware	168,493	1	1	New York	5,997,853	34	34
Florida	391,422	2	2	North Carolina	1,617,947	9	9
Georgia	1,837,353	11	10	North Dakota	182,719	1	1
Idaho	84,385	1	1	Ohio	3 672,316	21	21
Illinois	3,826,351	22	20	Oregon	313,767	2	1
Indiana	2,192,404	13	13	Pennsylvania	5,258,014	30	28
Iowa	1,911,896	11	11	Rhode Island	345,506	2	2
Kansas	1,427,096	8	7	South Carolina	1,151,149	7	7
Kentucky	1,858,635	11	11	South Dakota	328,808	2	2
Louisiana	1,118,587	6	6	Tennessee	1,767,518	10	10
Maine	661,086	4	4	Texas	2,235,523	13	11
Maryland	1,042,390	6	6	Vermont	332,422	2	2
Massachusetts	2,238,943	13	12	Virginia	1,655,980	10	10
Michigan	2,093,889	12	11	Washington	349,390	2	1
Minnesota	1,301,826	7	5	West Virginia	762,794	4	4
Mississippi	1,289,600	7	7	Wisconsin	1,686,880	10	9
Missouri	2,679,184	15	14	Wyoming	60,705	1	1

The basis of representation is reached by dividing the total population of all the states by 356. Then by the quotient, which is 173,901, the population of each state is divided. If the population be exactly divisible by that number, the answer will show how many members of congress the state is entitled to; though no state can have less than one. But as there is often a fraction left over after doing this sum in division, the total of all the answers will be something less than 356, as it happens 339. These seventeen representatives are then allotted to the states having the largest fractions, one to each.

There were fourteen sessions of the Continental congress, as follows:

No.	Place.	Period of Session.	Presidents of the Continental Congress.	Date of Election.
			Peyton Randolph, Va.	1774, Sept. 5.
I.	Philadelphia	1774, Sept. 5—Oct. 26	Henry Middleton, S. C.	1774, Oct. 22.
II.	Philadelphia	1775, May 10—1776, Dec. 12	Peyton Randolph,* Va.	1775, May 10
III.	Baltimore	1776, Dec. 20—1777, Mar. 4	John Hancock Mass.	1775, May 24.
IV.	Philadelphia	1777, Mar. 4—1777, Sept. 18	Henry Laurens, S. Car.	1777, Nov. 1.
V.	Lancaster, Penn.	1777, Sept. 27.	John Jay, N. Y.	1778, Dec. 10.
VI.	York, Penn.	1777, Sept. 30—1778, June 27	Samuel Huntingdon, Conn.	1779, Sept. 28.
VII.	Philadelphia	1778, July 2—1783, June 21	Thomas McKean, Del.	1781, July 10.
VIII.	Princeton, N. J.	1783, June 30—Nov. 4	John Hanson, Md.	1781. Nov. 5.
IX.	Annapolis, Md.	1783, Nov. 26—1784. June 3	Elias Boudinot, N. J.	1782, Nov. 4.
X.	Trenton, N. J.	1784, Nov. 1—Dec. 24	Thomas Mifflin, Penn.	1783, Nov. 3.
XI.	New York	1785, Jan. 11—Nov. 4	Richard Henry Lee, Va.	1784, Nov. 30.
XII.	New York	1785, Nov. 7—1786, Nov. 3	John Hancock,† Mass.	1785, Nov. 22
XIII.	New York	1786, Nov. 6—1787, Oct. 30	Nathaniel Gorham, Mass.	1786, June 6.
XIV.	New York	1787, Nov. 5—1788, Oct. 21	Arthur St. Clair, Penn.	1787, Feb. 2.
			Cyrus Griffin, Va.	1788, Jan. 22.

U. S. CONGRESS.

No.	Period of Session.	Speaker.
I.	1789, March 4—1791, March 3	F. A. Muhlenberg, Penn.
II.	1791, October 24—1793, March 2	Jonathan Trumbull, Conn.
III.	1793, December 2—1795, March 3	F. A. Muhlenberg, Penn.
IV.	1795, December 7—1797, March 3	Jonathan Dayton, N. J.
V.	1797, May 15—1799—March 3	Jonathan Dayton, N. J.
VI.	1799, December 2—1801, March 3	Theodore Sedgwick, Mass.
VII.	1801, December 7—1803, March 3	Nathaniel Macon, N. C.
VIII.	1803, October 17—1805, March 3	Nathaniel Macon, N. C.
IX.	1805, December 2—1807, March 3	Nathaniel Macon, N. C.
X.	1807, October 26—1809, March 3	Joseph B. Varnum, Mass.
XI.	1809, May 22—1811, March 3	Joseph B. Varnum, Mass.
XII.	1811, November 4—1813, March 3	Henry Clay, Ky.
XIII.	1813, May 24—1815, March 2	Henry Clay, Ky. Langdon Cheves, S. C.
XIV.	1815, December 4—1817, March 3	Henry Clay, Ky.
XV.	1817, December 1—1819, March 3	Henry Clay, Ky.
XVI.	1819, December 6—1821, March 3	Henry Clay, Ky. John W. Taylor, N. Y.
XVII.	1821, December 3—1823, March 3	Philip P. Barbour, Va.
XVIII.	1823, December 1—1825, March 3	Henry Clay, Ky.

* D. 1775, Oct. 22.

† Resigned 1786, May 29.

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No.	Period of Session.	Speaker.
XIX	1825, December 5—1827, March 3	John W. Taylor, N. Y.
XX	1827, December 3—1829, March 3	Andrew Stevenson, Va.
XXI	1830, May 31—1831, March 3	Andrew Stevenson, Va.
XXII	1831, December 5—1833, March 2	Andrew Stevenson, Va.
XXIII	1833, December 2—1835, March 3	Andrew Stevenson, Va. John Bell, Tenn.
XXIV	1835, December 7—1837, March 3	James K. Polk, Tenn.
XXV	1837, September 4—1839, March 3	James K. Polk, Tenn.
XXVI	1839, December 2—1841, March 3	R. M. T. Hunter, Va.
XXVII	1841, May 31—1843, March 3	John White, Ky.
XXVIII	1843, December 4—1845, March 3	John W. Jones, Va.
XXIX	1845, December 1—1847, March 3	John W. Davis, Ind.
XXX	1847, December 6—1849, March 3	Robt. C. Winthrop, Mass.
XXXI	1849, December 3—1851, March 3	Howell Cobb, Ga.
XXXII	1851, December 1—1853, March 3	Linn Boyd, Ky.
XXXIII	1853, December 5—1855, March 3	Linn Boyd, Ky.
XXXIV	1855, December 3—1857, March 3	Nathaniel P. Banks, Mass.
XXXV	1857, December 7—1859, March 3	James L. Orr, S. C.
XXXVI	1859, December 5—1861, March 3	William Pennington, N. J.
XXXVII	1861, July 4—1863, March 3	Galusha A. Grow, Penn.
XXXVIII	1863, December 7—1865, March 3	Schuyler Colfax, Ind.
XXXIX	1865, December 4—1867, March 4	Schuyler Colfax, Ind.
XL	1867, March 4—1869, March 4	Schuyler Colfax, Ind.
XLI	1869, March 4—1871, March 4	James G. Blaine, Me.
XLII	1871, March 4—1873, March 4	James G. Blaine, Me.
XLIII	1873, December 1—1875, March 4	James G. Blaine, Me.
XLIV	1875, December 6—1877, March 4	Michael C. Kerr, Ind. Samuel J. Randall, Penn.
XLV	1877, October 15—1879, March 4	Samuel J. Randall, Penn.
XLVI	1879, March 18—1881, March 4	Samuel J. Randall, Penn.
XLVII	1881, December 5—1883, March 4	J. Warren Keifer, O.
XLVIII	1883, December 3—1885, March 4	John G. Carlisle, Ky.
XLIX	1885, March 4—1887, March 4	John G. Carlisle, Ky.
L	1887, March 4—1889, March 4	John G. Carlisle, Ky.
LI	1889, March 4—1891, March 4	Thomas B. Reed, Me.
LII	1891, March 4—1893, March 4	Charles F. Crisp, Ga.
LIII	1893, March 4—1895, March 4	Charles F. Crisp, Ga.
LIV	1895, March 4—1897, March 4	Thomas B. Reed, Me.
LV	1897, March 4—1899, March 4	Thomas B. Reed, Me.

See CONSTITUTION, SENATE, SPEAKER.

CONGRESSIONAL CEMETERY. A handsome cemetery near Washington containing monuments to such members of Congress as have died during their term of office. See WASHINGTON.

CONGRESSIONAL LIBRARY. See LIBRARIES.

CONGRESSIONAL RECORD. The official report of the proceedings of the United States Congress. Up to 1799 the senate sat with closed doors, and no reports of its proceedings were published. Since that time, an official record has been given to the public; and besides this, the journal of the proceedings of each house is required to be published. The so-called "executive sessions" of the senate are secret. The journal now known as the *Congressional Record* was from 1789 to 1824 called the *Annals of Congress;* from 1824 to 1837, the *Congressional Debates;* from 1837 to 1873, the *Congressional Globe.* Since 1873 the present name has been used. Unfortunately, the *Record* is not an accurate transcript of the actual proceedings. Members are allowed to revise their remarks before they appear in type; and they also frequently receive from the house "leave to print" speeches which they have never delivered, but which appear in the *Record* as though a part of the proceedings of the session.

CONGRESSMAN-AT-LARGE, name of a member of the U. S. House of Representatives, elected by the voters of the entire state, and not, as is customary, by those of a congressional district. Such congressmen are elected under the apportionment acts of Congress; and the election of a congressman-at-large is merely a device adopted to give each state the proper number of representatives under the acts until the state should be re-districted. Some states have had two such members, and several, one.

CONGRESS, PAN-AMERICAN. See RECIPROCITY.

CONGRESS WATER. See SARATOGA.

CONGREVE, RICHARD, positivist, was b. at Leamington, Sept. 4, 1818, and educated under Arnold, at Rugby, passing afterwards to Wadham college, Oxford, of which he became successively scholar, fellow, and tutor, but resigned after having become definitively a disciple of Comte. In 1855 he published a good edition of Aristotle's *Politics.* Later works are: *Lectures on the Roman Empire of the West* (1855); *Elizabeth of England* (1862); *The Catechism of Positivist Religion* (1858); *Essays Political, Social, and Religious* (1874); besides many propagandist sermons and addresses.

CON'GREVE, WILLIAM, the second son of Richard Congreve, esq., of Congreve and Stretton, was born about 1672, at Bardsey, Yorkshire. Educated at Kilkenny, and at Trinity College, Dublin, he in 1688 returned to England, and was entered at the middle temple, but he does not seem to have taken kindly to law. His first publication was a novel, entitled *Incognita, or Love and Duty Reconciled*, a performance which Dr.

Johnson said he would rather praise than read, but which has been neither read nor praised by succeeding critics. His first play, *The Old Bachelor*, was produced at Drury Lane, when C. was in his 19th year, and its success was remarkable. Next year he came out with *The Double Dealer*, which was a comparative failure; but his comedy, *Love for Love*, published in 1695, was a great success, and brought to its author money and fame. *The Mourning Bride*, a blank-verse tragedy, written after the manner of the old passionate masters, came out in 1697. Its success was enormous, far exceeding that of his comedies, but it has long since fallen from its high estate. Two years after, he produced his comedy, entitled *The Way of the World*,, which failed completely, and disgusted him with the theater. In other respects, C. was a fortunate man. He held various offices, which together yielded him an income of £1200. C. affected to despise his theatrical triumphs, and cultivated the modish airs of the fine gentleman, an eccentricity which laid him open to rebuke when he was visited by Voltaire. In his later days, he was afflicted by gout and blindness. He died 19th of Jan., 1729, at his house at Surrey street, in the Strand, London, at the age of 57, and was buried in Westminster Abbey, nobles supporting the pall.

As a writer of comedies, C. takes a high place, but not the highest. His plots are intricate and confused, and his dialogue is defiled by all the grossness of his age. He has none of those touches of nature that make the whole world kin. The element in which he moves is intrigue. His world is composed of wives, gallants, and husbands; and the wives and the gallants are in a continued conspiracy against the husbands. What strikes the reader of these plays, is the superabundant wit. But there is no discrimination or keeping in the brilliancy. The shoeblack is as witty as the hero. C. has so many good things to say, that he is glad to get a mouth to stick them in. He is the wittiest and the least amusing of writers. He has no heart, no generosity, no humor. His splendor is frosty, and the innumerable flashing points dazzle the eye, and make the brain ache.

CONGREVE, Sir WILLIAM, 1772–1828; the inventor of the Congreve rocket, a native of Staffordshire, Eng. He had a commission in the artillery, and became lieut. gen. He was also a member of parliament, and author of an *Elementary Treatise on the Mounting of Naval Ordnance*, and a *Description of the Hydro-pneumatic Lock.*

CONGREVE ROCKET. See ROCKET.

CONGRUOUS. In geometry, the term congruity is applied to lines and figures which exactly correspond when laid over one another. See COINCIDENCE.

In arithmetic, two numbers are said to be C., with respect to a third, when their difference is exactly divisible by it. Thus, 12 and 7 are C. with respect to 5, as

$$\frac{12-7}{5} = 1, \text{ and so are 27 and 12, as } \frac{27-12}{5} = 3.$$

The numbers considered must be whole numbers. When two numbers are C. to a third, either is called a *residual* of the other with respect to the third. C. numbers possess many curious properties, which have been applied by Gauss and other writers in the investigation of the properties of numbers.

CO'NI, or CUNEO, a province of Piedmont, Italy, on the French border; 2882 sq.m.; pop. '95, 660,923. The surface is about equally divided between plains and hills. The province is watered by streams that run into the Po. The chief productions are wheat, corn, hemp, rice, and silk. The capital is the city of the same name.

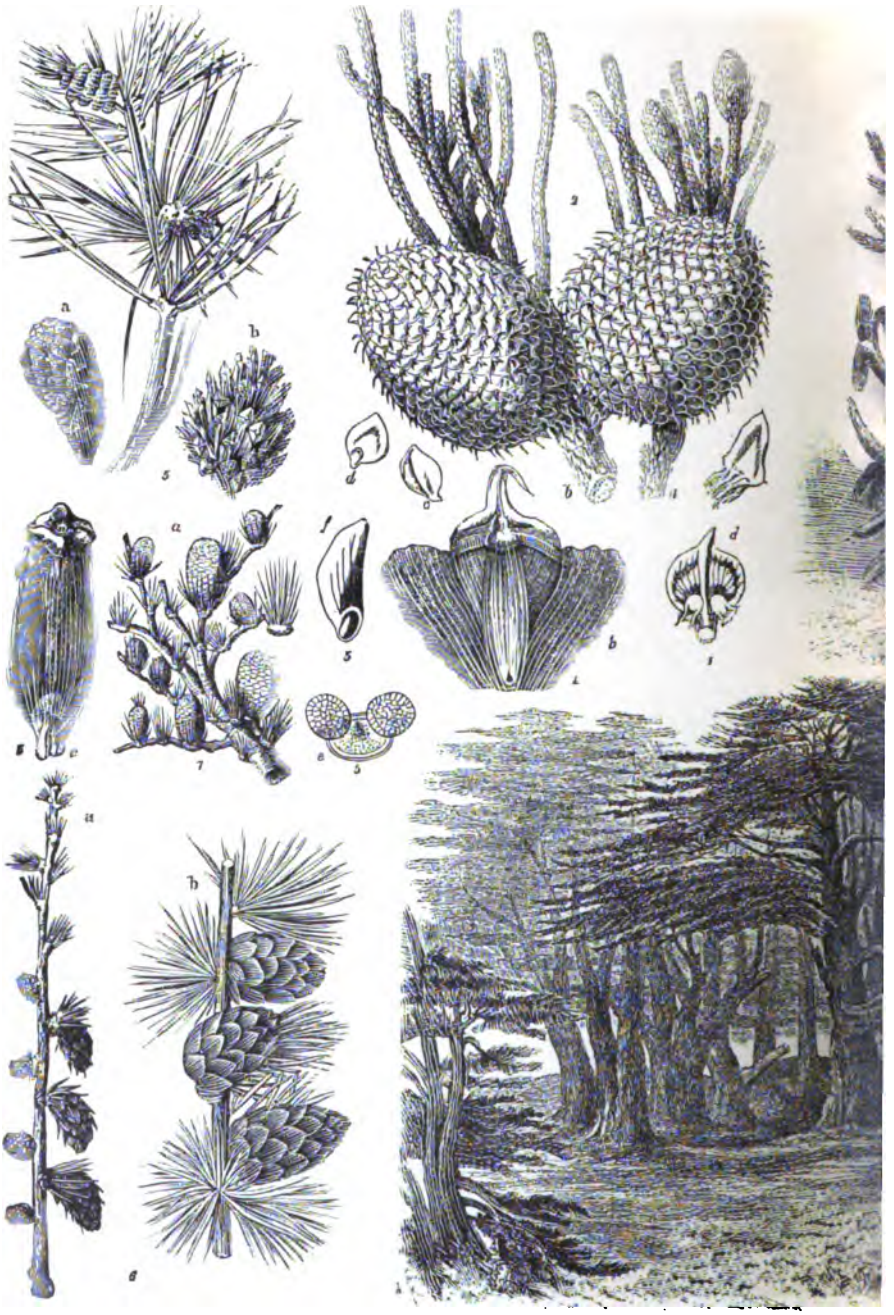
CO'NI, or CUNE'O, capital of a province of the same name in the kingdom of Italy, stands at the junction of the Stura and the Gesso, in a pleasant, fruitful, and well-cultivated district, 48 m. s.w. of Turin. Pop. '94, 29,800. The principal street is handsome, with arched piazzas; and there are several large churches, convents, and palaces. Its chief manufactures are silk and woolen cloth. Owing to its position on the road between Nice and Turin, it enjoys a brisk traffic.

CON'IC SECTIONS. See CONE, CIRCLE, ELLIPSE, PARABOLA, and HYPERBOLA.

CONIF'ERÆ (Lat. cone-bearers), an important natural order of exogenous plants, containing the pines, firs, juniper, yew, etc.; agreeing with the other exogenous orders generally in the structure of the stem and in the mode of vegetation, but differing remarkably from most of them in having naked ovules—i.e., ovules which are not enclosed in an ovary, but are fertilised by the direct application of the pollen to the *foramen*, without the intervention of style or stigma—and upon this account separated from them, along with *cycadaceæ* (q.v.), by Lindley, Endicher, and others, as a distinct class, under the name *gymnogens gymnospermæ*. The flowers are unisexual, the male and female sometimes on the same, sometimes on separate plants; the male flowers have either one stamen or one bundle of stamens, the anthers often crested; the female flowers are in cones or solitary; the place of ovaries is supplied by the flat scales of the cones, the ovules are usually in pairs on the face of the scales, either inverted or erect. The fruit is either a cone—the scales of which sometimes become fleshy, and are incorporated into a berry-like fruit—or a solitary naked seed. The seed has a hard crustaceous integument; the embryo is in the midst of fleshy, oily albumen; the cotyledons are either two, or numerous and whorled. The mode of branching is peculiar, numerous buds proceeding from the side of the main stem, so as generally to form whorls of

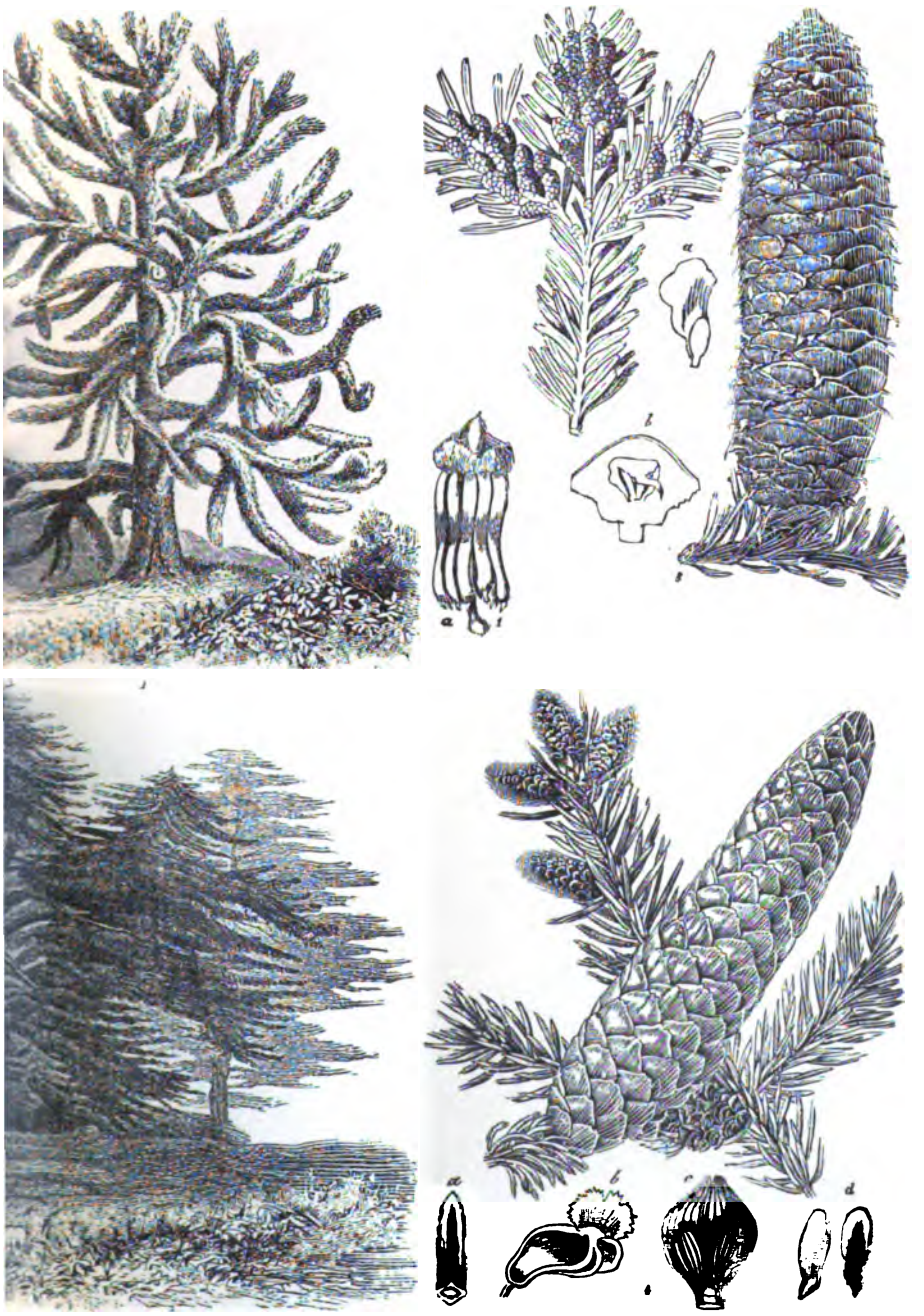
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CONIFERÆ.—1. Araucaria imbricata (Chili Pine); *a*, stamen; *b*, one-ovaled pistil. 2. Ara
3. Abies pectinata (Silver Fir); one branch with cone, the other with staminate flowe
staminate flowers; *a*, leaf; *b*, anther; *c*, pistil; *d*, seeds. 5. Pinus sylvestris (Scotch I
6. Larix Europæa (European Larch); *a*, branch with staminate and pistillate flowers;

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aria columnaris ; *a*, branch with sterile flowers ; *b*, branch with cones ; *c*, *d*, *e*, scales. · *a*, pistil ; scale with bract. 4. Abies excelsa (Norway Spruce) ; cone and branch with ıe or Fir) ; *a*, young ; *b*, mature cone ; *c*, scale of cone ; *d*, pistil ; *e*, pollen-grain, *f*, seed. branch with mature cones. 7. Cedrus Libani (Cedar of Lebanon).

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branches, which are generally almost horizontal in their direction, whilst the central vertical shoot runs up often with admirable straightness, and some of the C. attain a height unrivaled among other forest-trees, of which the *Wellingtonia* (q.v.) of California affords the most noble example. The wood consists of *punctated* cells; the sides of the tubes or elongated cells which form it, and which are nearly of equal diameter, being marked by circular disks, which, when highly magnified, exhibit a small internal circle surrounded by a larger external one. This peculiarity of the wood of the C. is important, as enabling us to recognize it in a fossil state, and to refer many fossils, particularly of the coal formation, to this order. The leaves of the C. differ very widely from those of the closely allied order *cycadaceæ*. Most of the C. have very narrow veinless leaves, so that the Germans call them *needle-woods* (Nadelhölzer) in contradistinction to the other European forest-trees, which they call *leaf-woods* (Laubhölzer). By far the greater number of them belong to the northern hemisphere. The C. are very long-lived; some of them are supposed to be capable of attaining an age of 2,000 or 3,000 years. When the stem of a coniferous tree is cut across, it does not sprout again from the root. The C., besides the great usefulness of the timber of many, are remarkably productive of turpentines (q.v.) and resins (q.v.). Astringent substances are also found in their bark, and fixed oil in their seeds. The seeds of some species of *pine* and *araucaria* are used as food.

The C. are divided into—1. *Abietineæ*, having inverted ovules and woody cones, as the pines, firs, larch, cedar, araucaria, etc. 2. *Cupressineæ*, with erect ovules, and either woody or fleshy cones, as the juniper, arbor-vitæ, cypress, etc. 3. *Taxineæ*, with solitary seeds, as the yew, gingko, etc. 4. *Gnetaceæ*, plants of comparatively humble growth, with jointed stems, often regarded as forming a distinct order. See SEAGRAPE. Lindley and others also make the *taxineæ* a distinct order. See YEW.

CO'NIINE, or CONINE, an alkaloid constituting the poisonous principle of poison hemlock; formula, $C_8H_{15}N$. It is an oily liquid, specific gravity 0.89, boiling at 338° F. It has a penetrating and repulsive odor, and a sharp taste. It is easily soluble in alcohol and ether, but slightly so in water. Its action is that of an acrid narcotic poison. In common with the seeds and leaves of the plant, the alkaloid is used in pharmacy as a narcotic.

CON'INGTON, JOHN, 1825–69; a native of Lincolnshire, Eng., remarkable for precocity, knowing the letters of the alphabet when he was but 14 mos. old, and reading well at 3½ years. He was educated at Oxford, and in 1854 was appointed to the newly founded chair of Latin literature in Corpus Christi college. Among his works were translations of the *Agamemnon* and the *Choephori* of Æschylus; Virgil's *Eclogues and Georgics;* the *Odes of Horace;* Virgil's *Æneid;* the last 12 books of the *Iliad;* and the *Ars Poetica* of Horace.

CONIROS'TRES, a tribe or section of the order of birds called *insessores*, and characterized by a strong conical bill, without notches. The feet are, in general, adapted for walking on the ground, as well as for perching. The bill varies much in its thickness, and those species in which it is thickest, in general feed most exclusively on seeds. The number of birds belonging to this tribe is very great; and the families differ much in many respects. Among them are finches, sparrows, buntings, linnets, larks, plantain-eaters, colies, crows, birds-of-paradise, starlings, and even hornbills.

CO'NIUM. See HEMLOCK.

CONJUGAL RIGHTS. See MARRIAGE.

CONJUGA'TION (Lat. a connecting or yoking together), a term in grammar applied to a connected view or statement of the changes of form that a verb (q.v.) undergoes in its various relations. See INFLECTION. The forms usually included under this term are those that serve to mark: 1. *Person*, or the distinction between the speaker, the spoken-to, and the spoken-about; as (I) *write*, (thou) *writest*, (he) *writes*. 2. *Number;* as (John) *writes*, (they) *write*. 3. *Tense*, or time; as (I) *write, wrote, have written, will write*. 4. *Mood*, or the manner in which the action is presented. When the action is simply asserted, it is the indicative mood, as (he) *wrote;* when put as a supposition or condition, it is the conditional mood, as, *if he wrote*. The potential mood expresses the power of doing the action, as, *he can write;* and the imperative commands the doing of it—*write*. The infinitive mood expresses the action without limitation of any kind—*to write;* as it makes no affirmation, it is, strictly speaking, not a verb, but a kind of abstract noun. The two participles, the one expressing the action as in progress (*writing*), the other as completed (*written*), may be classed with the infinitive, as not affirming anything. In opposition to the infinitive and the participles, the other parts of the verb are called finite 5. *Voice*, or distinction between active and passive (see VERB); as (he) *wrote* (the letter), (the letter) *was written* (by him).

In English, and in most modern European languages, the greater part of those distinctions are indicated by separate words; in Sanscrit, Greek, and Latin, they were nearly all indicated by prefixes and affixes, or other modifications of the word itself. The nature and origin of these modifications are considered under the head INFLECTION. All verbs do not take the same changes even in the same language. Although the affixes, e.g., may have originally been the same, yet they underwent, in course of

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time, different kinds or corruption or obliteration, depending upon the nature of the letters in the root verb. This leads to the verbs of a language being arranged in different classes or conjugations. In Latin, for instance, grammarians recognize four conjugations, and verbs that cannot be brought into any class are called irregular verbs.

In English, there are two distinct types of the inflection of verbs; thus, *I love*, becomes in the past tense, *I loved*, and in the passive voice, *I am loved;* while *he shakes* becomes *he shook*, and *he was shaken*. Verbs that, like *love*, take *d* (or *ed*—sometimes *t*) in their past tense and past participle, form one class or C.; and those resembling *shake* in their changes form another. The former class is by far the most numerous; but the latter includes the most commonly used and oldest verbs in the language. The mode of change seen in *shake, shook, shaken*, is believed to be more ancient than the other, and is therefore called the old C., and sometimes the strong C., the other being the new or weak. The verbs belonging to the old C. are all of Saxon origin, and are primitive or root verbs; while derivative verbs belong to the other class. Verbs of the weak C. are pretty uniform in taking *d* or *ed*, although after certain letters the *d* is of necessity pronounced as *t*, and is sometimes replaced by that letter in writing—*dipt*. With regard to verbs of the strong C., no rule can be given as to the change of vowel by which the past tense is formed. A certain method is discernible. Thus:

1. Rise, rose; smite, smote; ride, rode; drive, drove, etc.
2. Cleave, clove; steal, stole; speak, spoke; tear, tore, etc.

For further information on the C. of English verbs, see Latham's *English Language*, or Lounsbury's *English Language* (1882). See GRAMMAR and INFLECTION.

CONJUGATION OF CELLS, a union of two distinct cells of a plant, in order to reproduction. It has been observed only in the *conferv*aceæ and *diatomaceæ*. Two cells come into contact, as by two filaments of a *conferva* being brought together, and little projections are formed from each, the points of which are absorbed, and thus a tube is formed, through which one of the cells empties itself into the other. The latter then becomes a *mother-cell*, and produces spores.

CONJUNCT AND CONFIDENT. See INSOLVENCY.

CONJUNCTION, in astronomy, is one of the aspects (q. v.) of the planets. Two heavenly bodies are in C. when they have the same longitude—that is, when the same perpendicular to the ecliptic passes through both. If they have, at the same time, the same latitude—that is, if they are both equally far n. or s. of the ecliptic—they appear from the earth to be in the same spot of the heavens, and to cover one another. The sun and moon are in C. at the period of new moon. In the case of the inferior planets, Mercury and Venus, there is an inferior C. when the planet is between the earth and the sun, and a superior when the sun is between the earth and the planet. In general, a heavenly body is in C. with the sun when it is on the same side of the earth and in a line with him; and it is in *opposition* to the sun when it is on the opposite side of the earth, the earth being in a line between it and the sun. Planets are invisible when in C. with the sun, except in rare cases when an inferior planet passes over the sun's disk, and may be seen as a speck on his surface. Conjunctions are either *geocentric* or *heliocentric*, according as they are actually witnessed from the earth, or as they would be witnessed if observed from the sun. In observing a C. from the earth's surface, it is usual to reduce the observation to what it would be if made from the earth's center. By this means, the exact times of C. are more accurately fixed, and the observations of one astronomer made available to every other, wherever he may be on the earth's surface. *Grand conjunctions* are those where several stars or planets are found together. The Chinese history records one in the reign of the emperor Tchuen-hiu (2514–2436 B.C.), which astronomers calculate to have actually taken place.

CONJUNCTION, OR **SYNAPHE** (Gr., συναφή), in music, was the name given by the Greeks to their old system of tuning the seven-stringed lyre. The new system, which came into use with the eight-stringed lyre, was called Harmony (ἁρμονία).

CONJUNCTIONS, one of the "parts of speech," or classes, into which grammarians divide words. C. serve the purpose of connecting sentences, parts of sentences, and single words; as "Day ends, *and* night begins. William *and* John learn Latin. Charles *and* James carried the basket between them." In the first sentence, *and* connects two separate affirmations into one compound sentence. The same is true in the second—the separate affirmations being "William learns Latin," and "John learns Latin." In the third sentence, *and* connects only the two words, "Charles" and "James," as it cannot be affirmed of either of them alone that he "carried the basket." In most cases, however, it can be shown that, logically at least, two affirmations are involved, and that the conjunction really connects the affirmations. It is not easy to distinguish C. from adverbs. In fact, C. were all originally other parts of speech; and the greater part of them are still really adverbs, and owe their conjunctive effect to their signification as adverbs. In *and* and *but*, whatever may have been the original meaning, we now attend only to the conjunctive effect; *or* is a shortened form of the pronominal adjective *other;* and *nor* is *or* with the negative prefixed. In such a sentence as, "I believe that you are wrong," *that* is the demonstrative pronoun, equivalent to—I believe *this*, viz., "you are wrong." This is clearly seen in the corresponding words in other

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languages: Ger. *dass*, Fr. *que*, Lat. *quod* (for the relatives were originally demonstrative pronouns). All the rest might be called adverbial C. or conjunctive adverbs. Ex., "He is industrious; *therefore* he is happy"—that is, "he is happy *for that.*" This adverb, or adverbial phrase, expressive of the cause of the happiness, by referring us back for its meaning to the former assertion, has the effect of connecting the two assertions in the mind. Again, "The messenger arrived *while* he was speaking." Here *while* is equivalent to *at the time at which* (he was speaking). As an adverbial phrase, this simply indicates the time of the act of "arriving;" but as it also expresses that the speaking was going on at the same time, it thus conjoins the two assertions.

The most important distinction among C. will be seen in the following pair of sentences·

The sun went down, *and* the moon rose.
The moon rose, *as* the sun went down.

The first (compound) sentence contains two simple sentences or assertions, linked together, yet each standing on an independent footing; the two are joined on terms of equality, and are therefore said to be *co-ordinate*, and the conjunction is called a co-ordinating conjunction. In the second sentence, the last clause, though a grammatical sentence, contains no logical proposition, no assertion made for its own sake, but merely states a fact as a modifying circumstance with regard to the assertion contained in the first clause. The sentence of the second clause is therefore *subordinate* to that of the first, and the conjunction that marks the relation, a subordinating conjunction. The chief co-ordinating C. are:

1. *And, also, likewise, not only—but, partly—partly, first—then, further.* All these are used to tack on sentences whose sense accords with, or adds to, the effect of what goes before. Hence they might be called *cumulative* conjunctions. The following (2) mark various degrees of opposition in the sense or effect of the sentences, and might be called *adversative* conjunctions. These terms seem preferable to *conjunctive* and *disjunctive*, generally used.

2. { (*a.*) *Not—but, else, otherwise* (exclusive).
   { (*b.*) *Either—or, neither—nor* (alternative).
   { (*c.*) *But, only, yet, still, at the same time, nevertheless.*

3. *Therefore, wherefore, for, thus, consequently, hence, accordingly, so, so that.* (Cause and effect.)

All other C. may be classed as subordinating, such being their usual function.

CONJUNCTIVITIS is an inflammation of the conjunctiva, or the mucous membrane that covers the external surface of the eyeball, and the internal surface of the eyelids. It may be caused by cold winds or by irritating particles, and there is one form that is probably contagious. Chronic conjunctivitis may result from the above, or may occur from overstrain of hypermetropic eyes. In both cases, the treatment should be to bathe the eyes freely with some astringent lotion, and at night to apply some ointment to the lids to prevent their adhesion. See Eye.

CONJURING. See Magic; Incantation.

CONKLING, ROSCOE, politician, was b. in Albany, N. Y., Oct. 30, 1829. He studied law and began practice in Utica in 1846. In 1861, he was elected a Member of Congress, serving until 1867, when he was elected U. S. senator, a position he filled until 1881. In 1880 he was an ardent advocate of Gen. Grant's nomination for a third term; failing in this he became quite antagonistic to President Garfield, even demanding the withdrawal of the nomination of W. H. Robertson as collector of the port of New York. When this demand was refused, Conkling, and his colleague, Thomas C. Platt, resigned their seats in the senate, appealing to the state legislature to re-elect them in justification of their course. They were not, however, re-elected. Conkling then returned to the practice of his profession in New York. He was for many years one of the most conspicuous figures among American statesmen. He died in 1888.

CONNAUGHT, the westmost and smallest of the four provinces of Ireland. It is bounded n. and w. by the Atlantic; e. by Ulster and Leinster, from the latter of which it is separated by the Shannon; and s. by Munster. It contains the counties of Galway, Leitrim, Mayo, Roscommon, and Sligo. Area, 6867 sq. m. Pop. '81, 821,657; '91, 724,774, a decrease in ten years of 11.79 per cent.

CONNAUGHT, Arthur William Patrick Albert, Duke of, Prince of the United Kingdom, Duke of Saxony, Prince of Coburg and Gotha, b. at Buckingham Palace, 1850; third son of Queen Victoria. He entered the military academy at Woolwich, 1866, made rapid progress on the royal road of promotion, and in 1880 became gen. of brigade. He was created Duke of Connaught and Strathearn and Earl of Sussex, 1874, and took his seat in the house of lords. In 1879 he married Princess Margaret Louise, grandniece of the emperor of Germany. He served in Egypt in 1882, and in 1894 was put in charge of the permanent camp at Aldershot.

CONNEAUT, a township and village on Conneaut creek, Ashtabula co., O., 2 m. s. of lake Erie, near the Pennsylvania line, and noted as the landing place of the first white settlers of northern Ohio, in 1796. There is a good harbor at the mouth of the

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creek with a lighthouse. Several railroads pass through the town. There are manufactures of flour, leather, paper, etc., and banks. Pop. of township, '90, 4811.

CONNECTICUT, a New England state, and one of the original 13; between lat. 41° and 42° 3′ n.; long. 71° 55′ and 73° 50′ w.; bounded on the n. by Massachusetts; on the e. by Rhode Island; on the s. by Long Island sound; on the w. by New York; average length, 86 m.; av. breadth, 55 m.; extreme southern length, 100 m.; area, 4990 sq.m., of which 145 are water, or 3,193,600 acres.

HISTORY.—C. was granted to the Plymouth company in 1606. In 1614 Adrian Block, a Hollander, discovered and explored the C. river, and in 1623 the Dutch of New Amsterdam began a trading post at Suckiaug (Hartford). In 1631 the soil from Narragansett bay to the Pacific ocean was granted by the earl of Warwick to lord Say and Sele and others, but the transfer apparently had no legal basis. In 1633, in response to invitations by the Indians, Plymouth, Mass., traders built a house at Matianuck (Windsor). In 1634 Pyquag (Wethersfield) and in 1635 Dorchester (Windsor) and Hartford were settled by emigrants from Massachusetts bay. The Plymouth (English) company disbanded in 1635, and in that year the Say and Sele patentees, considering themselves the owners of C., sent over John Winthrop, Jr., to act as governor for one year. He built a fort at Saybrook, preventing the Dutch from getting control of the C., and gave the settlers in the upper valley a conditional permission to remain. Desire for a more democratic government caused a new exodus from Massachusetts, and in 1636 Hartford, Windsor, and Wethersfield received their chief bodies of emigrants. The first general court met at Hartford, May 1, 1637. In 1638–39 the three towns united in an independent commonwealth, adopting the first written constitution known to history, and "the first in America to embody the democratic idea" Agawam (Springfield) remained nominally associated till 1641. In May, 1637, a force under Capt. John Mason, in retaliation for murders committed by the Pequots, the leading Indian tribe, invaded their country and nearly exterminated them. In 1638 Quinnipiack (New Haven) was settled by a Puritan colony, as were, 1638–40, Milford, Guilford, Stamford, and Southold, L. I. These towns, together with Branford, united, 1643–51, with New Haven, and Theophilus Eaton was made governor of the confederacy. "The judicial laws of God as delivered by Moses" were the rule for all courts, and the somewhat similar code of C. gave rise in after years to the nickname "blue laws" (q.v.). The C. code of laws, drawn up in 1650, reduced capital offenses from 160 (in England) to 15; Quakers were not severely dealt with, and few executions for "witchcraft" are recorded. Unlike New Haven, Hartford did not limit the elective franchise and office-holding to churchmembers, and the system of town government developed fully on her soil. In 1644 Hartford bought from George Fenwick, agent at Saybrook for Say and Sele, that isolated colony (settled 1639), and gradually (1644–62) by purchase, colonization, etc., acquired the greater part of the present state, and much of Long Island. In 1657 John Winthrop, Jr., was chosen governor of C., and by his diplomacy, April, 1662, procured a charter from Charles II. giving absolutely free government to that colony and defining its bounds in the terms of the Warwick patent, thus including New Haven. The latter, impoverished by unsuccessful business ventures, weakened by internal troubles, and dreading the duke of York, to whom her territory had been granted, also, reluctantly united with C. In October, 1687, sir Edmund Andros came to Hartford and demanded the charter from the general assembly, but it was carried away and secreted till 1693. See CHARTER OAK. In 1701 it was decreed that the May session of the assembly should thereafter be held in Hartford and the October session in New Haven. In 1708 the Saybrook platform was adopted, and in 1742 Congregationalism was made the established form of religious government, though other denominations were allowed to establish churches. The colony was very active in the French and Indian wars. In 1754 C. bought from the Indians a large tract of land in Pennsylvania and proceeded to settle it, but was compelled in 1782 to give it up to Pennsylvania. In 1786 C. relinquished her charter rights to the territory w. of her present limits, receiving in return the western reserve (q.v.). Emigration thither was large, as was that to Vermont soon after, and to western New York, this emigration lasting about 40 years. The passage of the stamp act was vigorously denounced by the general assembly; in May, 1776, the colony was declared released from its allegiance, and in October C. was declared an independent state. She sent 31,939 men into the continental army, and her governor, Jonathan Trumbull ("brother Jonathan"), was Washington's most valued counsellor. In 1777 the British burned Danbury, and in 1779 pillaged New Haven and burned Fairfield, Green's Farms, and Norwalk. In 1781, Sept. 6, forts Griswold and Trumbull at New London were taken by Benedict Arnold, and the town was destroyed. C. ratified the federal constitution, Jan. 9, 1788, by a vote of 128 to 40. Her share in framing it was important, and to her was due the adoption of state equality in the upper house of congress, and of proportionate representation in the lower. C. was the stronghold of federalism, and opposed the war of 1812; nevertheless, 2600 men were raised for home defense. The blockade of New London and the Hartford convention (q.v.) belong to this period. In 1818 a new constitution was framed; church and state were separated, and the general assembly was divided into a senate and house of representatives. The state furnished in the civil war 57,379 troops, 1764 of whom were colored. In 1873 Hartford became the sole capital.

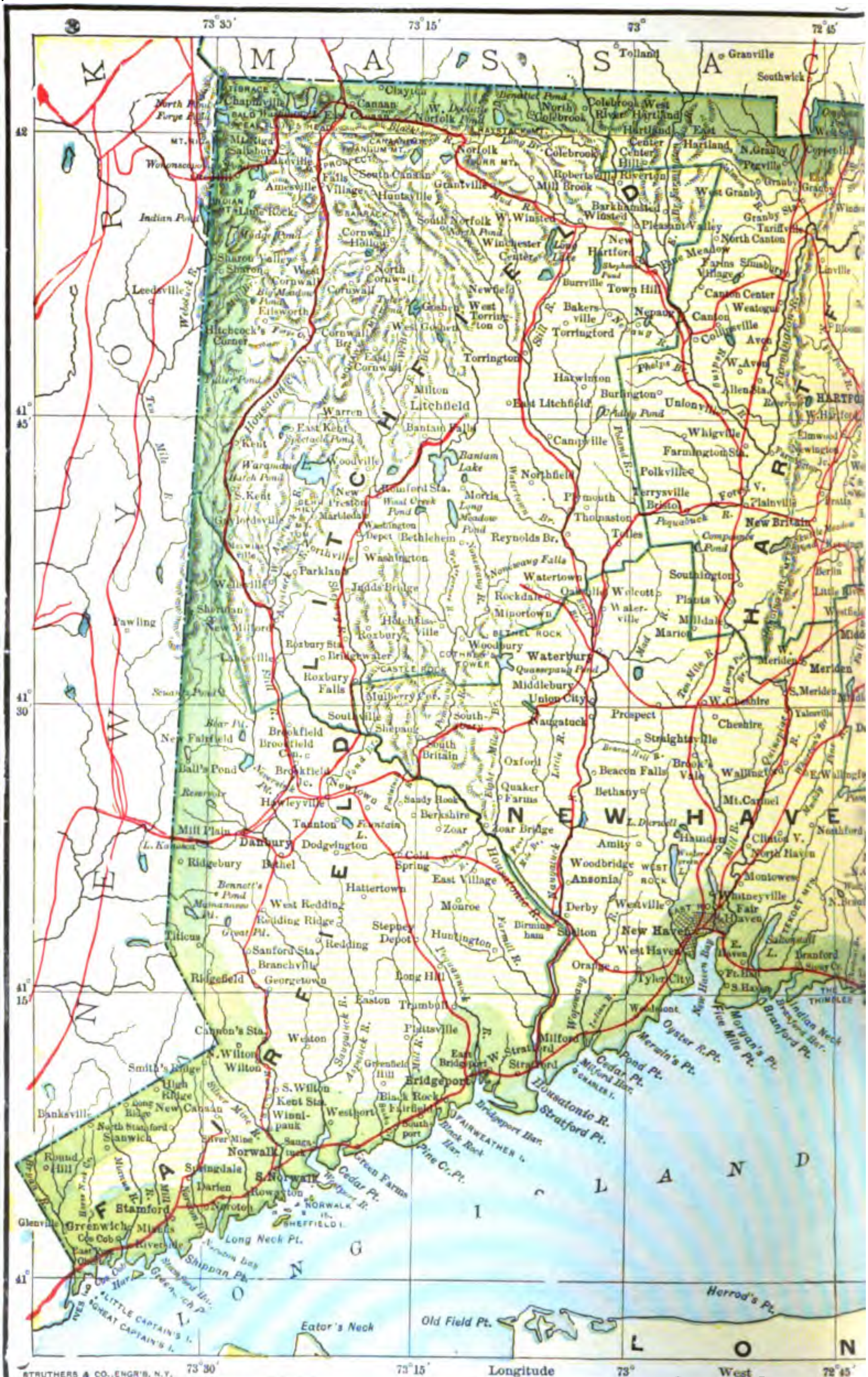
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AREA AND POPULATION OF CONNECTICUT BY COUNTIES

(ELEVENTH CENSUS: 1890.)

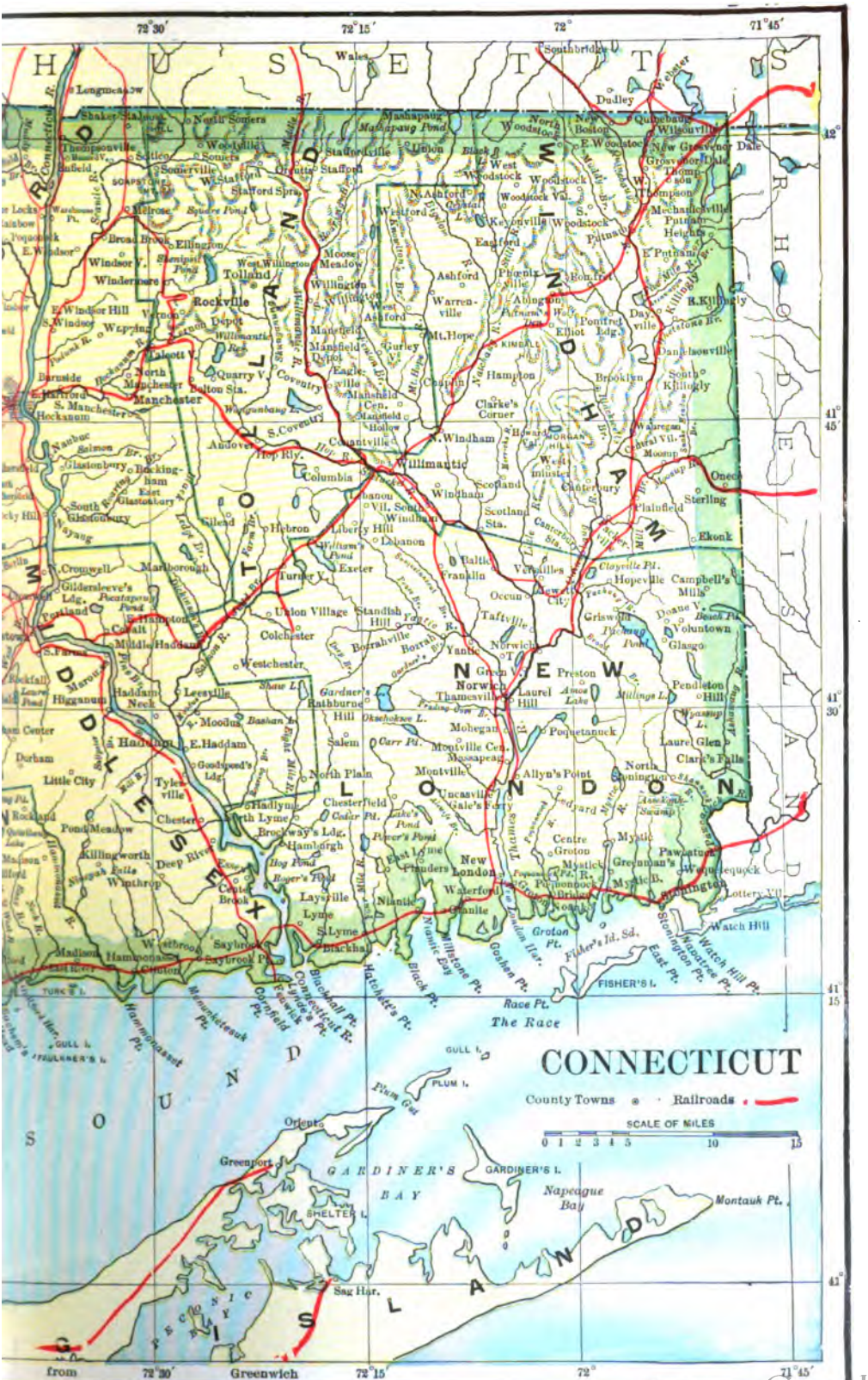
	Area in Square Miles.	Population.		Area in Square Miles.	Population.
Fairfield	540	150,081	New London	687	76,634
Hartford	738	147,180	Tolland	403	25,081
Litchfield	948	53,542	Windham	520	45,158
Middlesex	390	39,524			
New Haven	619	209,058	Total	4,845	746,258

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TOPOGRAPHY.—The state lies on the s. slope of the New England hill region, and is made up of river valleys enclosed by ranges of hills which stretch n. and s. and increase in height and ruggedness toward the w. The Holyoke Range, known at Hartford as Talcott Mountain, ends at Southington in the Hanging Hills, the highest of which is 995 ft. above sea level. Bluffs and abrupt eminences of trap, such as East and West rocks at New Haven, are numerous. The highest elevation (in Litchfield co.) is Bear Mt., Salisbury, 2354 ft. The Connecticut River (q.v.) has as its chief tributary the Tunxis or Farmington which enters it at Windsor. The Thames, formed by the Shetucket, Yantic, and Quinnebaug, and flowing through a narrow valley, with the Willimantic, its chief tributary, are the principal rivers in the e.; in the w. they are the Housatonic, which rises in Massachusetts, and the Naugatuck, which joins the former at Derby. The Thames is navigable to Norwich; the Housatonic to Derby. The coast line, 100 m. in length, is broken by many harbors, of which New Haven is the largest and New London the deepest and most sheltered. There are no lakes of large size.

GEOLOGY.—The greater part of the state is occupied by primary rocks, which are separated into so-called eastern and western sections by secondary rocks: formations or basins of red sandstone and shale traversed by dikes and ridges of trap. The primary rocks are of original materials entirely, and include gneiss, mica slate, sienite, granite, argillite, and chlorite slate. The trap rocks, all of intrusive or igneous origin, are connected with both primary and secondary formations. The eastern and western sections are each traversed by extensive trap dikes, to which belong East and West Rocks at New Haven. Boulders of great size are common, and the tops of many hills are composed of drift materials. The diluvial current passed from n.n.e. to s.s.e. The mountain sides in the Connecticut Valley exhibit glacial scratches.

MINERALOGY.—Copper and lead exist, but have never been mined with profit. Silver occurs in minute quantities in other ores. Hematite iron ore of the best quality abounds, and that of Salisbury is highly valued. The largest amount of feldspar (orthoclase) quarried in the United States comes from Glastonbury and Middletown. Portland, on the Connecticut River, is noted for its brown stone (old red sandstone) used for building purposes. Marble, limestone, flagging stone, tiling slate, fire-clay, granite, gneiss, sulphate of barytes, and trap-rock are unlimited in amount.

ZOÖLOGY.—The animals and birds include the wildcat, red fox, opossum, raccoon, rabbit, woodchuck, muskrat, otter, etc.; the Canada goose, Wilson's thrush, gull, winter wren, cedar bird, purple grosbeak, indigo bird, cardinal and rose-breasted grosbeak, oven bird, whippoorwill, yellow-billed cuckoo, great horned owl, marsh-hawk, golden eagle, mourning dove, ruffed grouse, quail, turnstone, great blue heron, and piping plover. The fish include the sturgeon, shad, pickerel, perch, trout, striped, rock, and black bass, alewife, sheepshead, weakfish, salmon and catfish. Mollusks and shell-fish are abundant, and the oyster beds of the coast are very valuable.

BOTANY.—The trees include the pitch and white pine, red cedar, tamarack, aspen, basswood, beech, chestnut, wild cherry, seven species of oak, among them the white, yellow, and red, two species of ash, four of maple, four of birch, three of elm, hickory, pignut, black-walnut, butternut, hop-hornbeam, holly, hackberry, pepperidge, wild plum, sassafras, sycamore, tulip tree, wild poplar, dogwood, and willow.

SOIL AND CLIMATE.—The Connecticut Valley as far as Middletown has a rich, deep, loamy soil, often with a clay subsoil. Below that point and generally along the coast it is sandy. The hills, as a rule, are better adapted to orchards and grazing than to cereals. The s.w. cos. have a dark, argillaceous soil, and in the n.e. a light gray loam occurs over a wide area. Spring opens rapidly in April; cold weather comes about mid-November, and the winters are usually severe, with deep snows in the mountains. The summers are correspondingly warm; the brief autumns very pleasant, though often foggy. The yearly mean temperature at Hartford is 49.81°; at New Haven, 49°; av. rainfall for the state, 11.77 in. Swamps and marshes do not abound.

AGRICULTURE.—The leading crops are tobacco, corn, oats, rye, buckwheat, potatoes, and hay. The tobacco, which is of superior quality and of mild flavor, is used chiefly for wrappers for cigars made from the stronger flavored Havana tobacco. The cultivation of this plant was begun in 1640, if not earlier, and it is confined mostly to the valleys of the Housatonic and Connecticut Rivers. Corn, oats, potatoes and hay are all large crops, and orchard fruits are abundant. Large quantities of market vegetables and small fruits, butter, cheese and milk are produced and find a ready home market in the numerous manufacturing towns. The cereal crops of the calendar year 1896 were valued at $1,101,095; the potato crop, $1,187,160; the hay crop, $7,192,616; and the tobacco crop, 10,197,450 pounds at $1,325,668. The farm animals, principally cows and horses, were valued at $8,699,912.

INDUSTRIES.—C. has long been noted for the variety and amount of its manufactures, and is favored both by its numerous streams and the intelligence and inventiveness of its workmen. In the production of iron ore, Litchfield County leads the state; the Salisbury ore beds, opened in 1732, are the oldest in the U. S. A furnace was built there in 1734, and one near Lakeville in 1750, and during the Revolution, though owned by a Royalist who fled to England, large quantities of cannon balls, shells, etc., were made here for the Continental Army. Litchfield County ore is now used largely for car-wheels. The state ranks high in cotton and woolen manufactures. At Norwich are cotton mills where the finest white cotton dress goods made in this country are produced. The first woolen mill in America was established in Hartford in 1788, but was

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short-lived. The woolen factories of that city are now famous, over twenty million pounds of wool being used there annually. In the manufacture of firearms and ammunition, this state ranks first in the Union. Hartford manufactures revolvers, the Hotchkiss rapid-fire guns, the Gardner machine guns, Gatling guns, and the Driggs-Schroder rapid-fire guns; the weapons of the Winchester Repeating Arms Company of New Haven are world renowned; the largest cartridge factory in the world is at Bridgeport; and immense powder works at Hazardsville from which $1,000,000 worth of powder was sent to Great Britain during the Crimean War. The famous Columbia bicycle is also manufactured at Hartford; and the Plympton Envelope factory is located here. This factory and one at Springfield, Mass., furnish the National government with stamped envelopes, the supply being six hundred millions annually. New Haven, beside firearms, has factories for book-sewing and wire-stitching machines, iron and brass; New London has silk and woolen factories; Meriden, silver-plated ware, artistic metal goods, gas and electric fixtures; Ansonia, clocks, brass and copper works, producing all sorts of rods, tubes, insulating wire, lamps, chandeliers, etc.; Waterbury, known as the "Brass City" from its large brass working factories, and for watches; Bristol and Thomaston, clocks; Collinsville, axes; Rockville, West Winsted and South Manchester, silk mills; New Britain and numerous other towns, the many small articles styled "Yankee notions;" Winsted, iron and steel works; Higgannum, the latest improved harrows and various other farming implements; Middletown, over a thousand styles of pumps, hydraulic machines, yard hydrants, etc. In short, it has been said that this state manufactures everything needed by modern civilization. In 1890 the number of industrial establishments was 6,822, which had a capital of $227,004,496, employed 149,939 persons, to whom $75,990,606 was paid in wages and had products valued at $248,336,364. New London and Stonington are engaged in cod and mackerel fisheries. The most important branch of the fisheries, however, is that of the oyster beds along the shores of Long Island Sound.

Commerce. — The ports of entry are Fairfield, New Haven, New London, and Stonington on the Sound and Hartford. Much of the commerce of this state passes through the port of New York. During the calendar year 1896 the direct imports of merchandise at these ports were valued at $980,317, and the exports at two ports only at $2,053. The internal and coasting commerce is also very large. The shipping of the state numbers about eight hundred vessels, sixty of which are engaged in foreign commerce.

Transportation. — Of all railroads the following have the largest mileage: New York and New England, 123 m.; New York, New Haven and Hartford, 123 m., with branches; New London Northern, 100 m.; New Haven and Northampton, 84 m.; Housatonic, 74 m.; Central New England, 66½ m.; Norwich and Worcester, 59½ m.; Naugatuck, 56½ m. The New York, New Haven, and Hartford company operates under lease the most important lines in the state. Reports of all lines showed in 1896, capital, $72,597,013; funded debt, $17,073,300; aggregate investment, $96,333,851; cost of roads and equipments, $85,747,891; net earnings, $7,106,682; and dividends on stock, $4,746,331.

Banks, Insurance, etc. — On Oct. 31, 1896 there were 82 national banks in operation, with capital $22,491,070, circulation $8,577,274, and deposits $32,819,836; 8 state banks, capital $2,240,000, deposits $5,091,727; 10 loan and trust companies, capital $1,135,000, deposits $6,083,550; and 90 mutual savings banks, deposits $143,159,123, and surplus $5,873,000. Hartford may be called the pioneer city in the fire insurance business, and her corporations are famous all over the world. The first fire insurance policy known in the U. S. was issued in 1794, on a single house "insured against fire and all damages of fire" by a firm of private individuals; and in 1810 this firm and several other gentlemen organized the actual Hartford Fire Insurance Company. In 1896 there were over 100 insurance companies of various kinds authorized to conduct business in the State.

Education, Churches, etc. — The chief educational institutions are Yale Univ., non-sectarian, though historically affiliated with the Congregationalists; Wesleyan Univ. (M. E.), at Middletown, for both sexes; Trinity Coll. (P. E.), at Hartford. Schools of science, law, and medicine form departments of Yale Univ. The Congregationalists have divinity schools at New Haven and Hartford; the Protestant Episcopalians at Middletown. There is an industrial training school at New Haven; an agricultural school at Mansfield; an asylum for the deaf and dumb at Hartford; a home school for deaf mutes near Mystic River; a reform school at Meriden; an industrial school for girls at Middletown; and training schools for nurses at Hartford and New Haven. The Baptists have a literary institute at Suffield, and among preparatory schools are the grammar schools of Hartford and New Haven (founded 1664), and Norwich Free Academy. The Normal School at New Britain graduates two classes yearly. In 1895 the school population of the state was 188,160; the enrollment, 138,882; and the average daily attendance, 96,213. There was public school property valued at $8,450,000; income, $2,458,274; expenditure, $2,585,110. Public school buildings numbered 1,632; teachers, 3,633; private school pupils, 21,306. The state fund, whose nucleus was the sale of western lands under the early charter, has increased until it amounts to over $2,024,000, and is invested in land mortgages. The number of public libraries, large and small, in the state, is nearly 200, with an aggregate of over 800,000 volumes. The oldest newspaper is the *Hartford Courant*, founded in 1764, and there are now over 200 periodicals in the state. The leading religious denominations are the Congregational, Methodist Episcopal, Protestant Episcopal, Baptist, and Roman Catholic.

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GOVERNMENT, ETC.—Persons applying to become voters must be 21 years of age, be able to read, and must have lived 1 year in the state and 6 months in the town or ward. General elections for state officers and the general assembly are biennial, in even years, on the Tuesday after the first Monday in Nov. The general assembly consists of 24 senators and (1895) 252 representatives, each of the 168 towns having one or two. Senators and representatives are elected for a two years' term, and receive for the regular session $300 each, and one mileage each way at the rate of 25 cents per mile. For extra sessions no pay is allowed, but there is a mileage allowance as for the regular session. The assembly convenes on the Wednesday after the first Monday in January of each odd year. The governor's veto may be overcome by a majority vote of each house. The state officers are elected for two years. The governor receives $4000 salary per annum; the lieut. governor, who presides in the senate, $500; the secretary of state, treasurer, and comptroller, $1500 each. The judiciary consists of a supreme court of errors, with chief justice (salary, $5500) and 4 associate judges, with salary of $4000 each; a superior court of 6 judges, with salary of $4000 each (all the foregoing elected by the assembly for 8 years); courts of common pleas for Hartford, New Haven, New London, Fairfield, and Litchfield cos., each with one judge, except in New Haven co., where there are judges respectively for the civil and criminal sides; a district court in Waterbury; various city and borough courts and justices of the peace. Real estate acquired by a married woman's services, or conveyed to her for a consideration, may be held for her own use. The husband is trustee of a wife's personal estate, which upon his death falls to her or her devisees, legatees, or heirs, as though she had never been married; and married women may convey by devise the same as single persons, except that a husband (if he have not abandoned her) must unite in conveying by deed. Divorce may be had for fraudulent contract, adultery, desertion, and neglect of duty for three years, habitual intemperance, cruelty, for imprisonment for life, and for certain crimes. Previous residence required, three years; either party may remarry. The sale of liquor is regulated by each town in accordance with local-option laws. For retailing spirituous and intoxicating liquors not less than $100 nor more than $500 must be paid. The registration of voters is required in this state. New ballot laws based on the Australian system (q.v.) were adopted in 1889. Women may vote in an election for school officers. The legal rate of interest is six per cent. Judgments outlaw in seventeen years; notes and open accounts in six years. C has 4 representatives in the lower house of congress. The electoral votes have been cast as follows: 1789 (7 votes), Washington, 7, Adams, 5, Samuel Huntington of C., 2; 1792, Washington and Adams, 9; 1796, Adams, 9, Thomas Pinckney, 4, Jay, 5; 1800, for Adams and Pinckney; 1804, Pinckney and King; 1808, for same; 1812, Clinton and Ingersoll; 1816, King, and for vice-president, James Ross, of Pa., 5, and John Marshall, of Va., 4; 1820, Monroe and Tompkins; 1824 (8 votes only), J. Q. Adams and Jackson; 1828, Adams and Rush; 1832, Clay and Sergeant; 1836, Van Buren and Johnson; 1840 (6 only), Harrison and Tyler; 1844, Clay and Frelinghuysen; 1848, Taylor and Fillmore; 1852, Pierce and King; 1856, Fremont and Dayton; 1860, Lincoln and Hamlin; 1864, Lincoln and Johnson; 1868, Grant and Colfax; 1872, Grant and Wilson; 1876, Hayes and Wheeler; 1880, Garfield and Arthur; 1884, Cleveland and Hendricks; 1888, Cleveland and Thurman, 6; 1892, Cleveland and Stevenson, 6; 1896, McKinley and Hobart.

FINANCES.—The total assessed valuation of the state in 1895 was $452,863,714, about one-half of the actual value, and the highest figure ever reached. The total funded debt was $3,240,200; aggregate of civil list funds, $518,764; net debt, $2,721,446. The public school fund held property and securities to the value of $2,013,102.

INSTITUTIONS, ETC.—The institutions not educational are a prison at Wethersfield, a reform school for boys at Meriden, one for girls at Middletown, a school for imbeciles at Lakeville, and the asylums for the insane at Hartford and Middletown. The militia consists of the governor's horse and foot guards, two companies of each, aggregating 293 officers and men; the National Guard numbers twenty-five hundred fourteen men, organized into four regiments of infantry, a battalion of colored infantry, a battery of light artillery, and a small signal corps. Annual encampments are made at Niantic. There is a State Arsenal at Hartford, and a State Armory at New London; also a State Soldiers' Home at Noroton. The available militia force in time of war is about 105,000.

POPULATION, ETC.—In 1890 this state ranked twenty-ninth among the states in population. Population, 1637, 800; 1688, 17,000; 1755, 133,000—3500 slaves; 1787, 202,000; 1800, 251,002; 1820, 370,792; 1840, 309,978; 1850, 370,792; 1860, 460,147; 1880, 622,700; 1890, 746,258. There are 8 cos.; largest cities, 1890, were Hartford, 53,230; New Haven, 81,298; Bridgeport, 48,866; Waterbury, 28,646; Norwich, 16,156; Meriden, 21,652.

See general histories by Trumbull, Hollister, Dwight, Arthur, Carpenter, and Johnston (1887), also bibliography contained in the latter; Atwater's *History of New Haven; Memorial History of Hartford County; Connecticut State Register and Manual* (annual).

CONNECTICUT, the Indian *Quonehtacut* (Long river), the largest river e. of the Hudson in the U. S., rises in the extreme northern part of New Hampshire, separates that state from Vermont, flowing in a generally s.w. course; then, crossing Massachusetts and Connecticut in a more southerly direction, turns at Middletown to the s.e. and enters Long Island sound in lat. 41° 16′ 15″ n.; long. 72° 21′ w. Its length is about 450 m.; its width, from 150 ft. in the n. to 1050 ft. in Connecticut, and its fall in its course, about 1600 ft. Among the many falls are the Fifteen-mile falls, the White River falls, Bellows falls, and those at Montague and South Hadley. Its chief affluents are the White, West, Ashuelot, Deerfield, Miller's, Chicopee, Westfield, and Tunxis or Farming-

ton rivers. Vessels of 10 ft. draught ascend to Middletown, 34 m.; of 8 ft., to Hartford, 50 m.; and by means of canals, boats of 8 or 10 tons burden ascend to Newbury, Vt., 270 m. from L. I. sound. Tide-water ascends to Enfield falls, Conn.; the rise at Hartford is about one foot, and at Saybrook, 4 ft.

CONNELLSVILLE, a borough in Fayette co., Pa.; on the Youghiogheny river and the Baltimore and Ohio and the Pennsylvania railroads; 57 m. e. of Pittsburg. It is the centre of a widely noted coke region; was settled by Col. William Crawford in 1767; and has a state hospital, several national banks, high school, gas, electric light, and natural gas plants, electric street railroads, waterworks, manufactories of mining machinery, and large limestone, iron, and lumber interests. Pop. '90, 5629.

CONNELLY, Pierce Francis, b. in a southern state about 1840: was educated in England, and studied art in Paris and Rome. He worked for many years as a sculptor at Florence, and his statues and busts are highly prized. His best known works are "Thetis," "St. Martin and the Beggar," "Ophelia," "Horror arresting the Triumph of Death," "Queen Phillippa," "Lady Clare," "Diana transforming Actæon," "Viola," and "The Thread of Life." The last five were at the Centennial exhibition at Philadelphia, 1876. He explored New Zealand, 1877, and rendered services to science by painting the craters of volcanoes and the flora of the woods.

CONNEMARA. A district in the west of Galway, Ireland, skirting the coast, between the bays of Kilkieran and Ballinakill, but the name is often applied, in an ordinary way, to the whole western part of county Galway.

CONNOISSEUR (Fr.), a person who, without being an artist, is supposed to possess a discriminating knowledge of the merits of works of art. Such persons are called by the Italians *cognoscenti*. See Dilettanti.

CONNOTATION, a term of logic opposed to *denotation*. The *denotation*, extension, domain, or application of a term consists of the individual things to which the term applies. On the other hand the *connotation*, intention, depth, or intent of a term consists of the qualities possessed by the individual things to which the term applies. Thus, the *denotation* of the term metal consists of gold, silver, brass, iron, etc., to all of which the name metal is applied; the *connotation* of the term metal consists of the qualities possessed by gold, silver, and the other metals, viz., they are elements and are good conductors of heat and electricity, and possess a peculiar reflective power called metallic lustre. See Noun.

CO'NOID, a solid formed by the revolution of a conic section round its axis; such are the sphere, paraboloid, ellipsoid, and hyperboloid.

CONON, an Athenian gen., and one of the ten general officers who superseded Alcibiades, 407 B.C. In 405, the Athenian fleet was surprised by Lysander at Ægospotami, and Conon fled to Cyprus. During the war between Sparta and Persia he commanded, with Pharnabazus, an allied fleet, and in 394 defeated the Lacedæmonians. He restored the long walls and fortifications of the Piræus.

CONQUISTADORES (Span., "conquerors") is a collective term for the Spanish conquerors of America, such as Cortez, Balboa and Pizarro (q.v.).

CONRAD. See Konrad.

CONRAD, Robert Taylor, 1810–58; b. Philadelphia; a lawyer and author. While a student he wrote *Conrad of Naples*, a tragedy successfully represented in many cities. He wrote also for the press, and in 1822 began the *Daily Intelligencer*, which was soon merged in the *Philadelphia Gazette*. He edited *Graham's Magazine*, and was judge of the court of sessions. His best-known drama is *Aylmere* (or *Jack Cade*), in which Edwin Forrest represented the hero. He also published a volume of poems.

CONSAL'VI, Ercole, Cardinal, 1757–1824; b. Rome; a distinguished reformer of abuses in the papal states. He was made cardinal and secretary of state by Pope Pius VII., and in this capacity concluded the concordat with Napoleon in 1801. His resistance to the encroachments of France offended Napoleon, who forced the pope to remove him from office, but in 1815 he was employed in the transactions between Rome and Paris. As reformer of internal affairs he introduced the measure called *motu proprio*, suppressing monopolies.

CONSANGUINITY (Lat. *con*, together, and *sanguis*, blood), the relationship which subsists between persons who are of the same blood. It is either *direct*—which is the relationship between ascendants and descendants—or *collateral*, between persons sprung from a common ancestor. In the direct line, a son is said to stand in the first degree to his father; a grandson, in the second degree to his grandfather; and so on. In the collateral or oblique line, two different modes of numbering the degrees of consanguinity have been in use, the one that of the civil, the other of the canon law. By the civil law, the degrees are separately numbered downwards to each party from the common ancestor, the common ancestor not being counted. Thus, brothers are in the second degree of consanguinity; uncle and nephew in the third; cousins-german in the fourth; and second cousins, or the children of cousins-german, in the sixth degree. By the canon law, consanguinity in the equal oblique line, i.e., where the parties are equally removed from the common ancestor, is computed by the number of degrees between one of them only and the common ancestor; brothers being said to stand in the first, and cousins-german in the second, degree to each other. In the unequal oblique line, i.e., which the parties stand in different degrees of relationship to the common ancestor, the degree is

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determined by the number of steps between the common ancestor and the party further removed from him: thus, uncle and nephew are computed as in the second degree to each other, because the nephew, the further removed of the two, stands in the second degree to the common ancestor, his grandfather. See MARRIAGE; SUCCESSION; HEIR.

Affinity is the relationship brought about by marriage between a husband and the blood-relations of his wife, or between a wife and the blood-relations of her husband. The relations of one spouse in any particular degree of consanguinity stand in the same degree of affinity to the other spouse. There is no relationship by affinity between the blood-relations of the husband and those of the wife.

Consanguinity and affinity have been at different times and in different parts of the world more or less looked on as impediments to marriage between the parties related. Among the ancient Persians and Egyptians, marriages are said to have been sometimes sanctioned between brother and sister, and even father and daughter. The Athenians, while permitting marriages between brothers and sisters uterine, prohibited them between the same relations by the father's side or the full blood. In the book of Genesis, we read of Abraham marrying his half-sister. The Levitical law prohibited marriage between relations in the direct line, between brother and sister, nephew and aunt, and apparently by implication, uncle and niece. A son was prohibited from marrying his father's wife.

The Roman law prohibited marriage between ascendants and descendants, a prohibition extended to relations by adoption, and even after the dissolution of that tie. In the collateral line, the prohibited degrees included brother and sister (extending to persons so related by adoption where the tie continued to exist), and all cases where one party stood *in loco parentis* to the other, as uncle and niece. Marriage between cousins-german, at one time prohibited, was declared lawful by Arcadius and Honorius. The degrees prohibited in consanguinity were by Constantine also prohibited in affinity.

By the old canon law and early decretals, marriages were prohibited between persons as far removed as the seventh degree of consanguinity or affinity—i.e., between persons who might, by the civil law computation, be within the twelfth degree to one another. The fourth council of Lateran, 1215 A.D., narrowed the prohibition from the seventh to the fourth degree; i.e., the grandchildren of cousins-german. Affinity was held to be constituted not merely by marriage, but by the spiritual relationship of standing sponsor at baptism, and by illicit intercourse; marriage being prohibited between persons one of whom had had carnal connection with a relation in the fourth degree of the other. A marriage between persons related in any of these ways was accounted incestuous, and the children bastards. The pope assumed the right of granting dispensations from impediments to marriage arising from consanguinity and affinity, a power which seems to have been first exercised in the 12th century. In no instances have dispensations been granted to relations in the direct line, but one or two dispensations are said to have been granted between brother and sister; and between uncle and niece, they are still occasionally granted in countries where the canon law continues to be binding. Between remoter relations, they have been common. The extent to which these prohibitions were carried, and the possibility of their being dispensed with, naturally tended to encourage profligacy and lax ideas of the marriage tie, it being hardly possible to say of any marriage that it might not one day be proved invalid. The council of Trent restricted the impediment of affinity from illicit intercourse to the second degree.

In the countries which embraced the reformation, a general relaxation took place in the prohibitions to marriage from consanguinity and affinity. In England, 32 Hen. VIII. c. 38 allowed all persons to marry who were not prohibited by the Levitical law; and according to the interpretation put on this statute, the prohibitions included all relations in the direct line, brother and sister, and collaterals, when one party is brother or sister to the direct ascendant or descendant of the other; the degrees prohibited in consanguinity being equally prohibited in affinity. The prohibitions from consanguinity have been held to extend to bastard relations. But down to 1835, marriages within the prohibited degrees were valid and the issue legitimate, unless the marriage had been annulled by a declaratory sentence of the ecclesiastical court, which could only be obtained while both spouses were alive. By act 5 and 6 Will. IV. c. 54, all marriages within the prohibited degrees of consanguinity and affinity were made absolutely void.

In Scotland, for a very short time after the reformation, the papal power of dispensation was exercised by the crown. Acts 1567, c. 14, and 1567, c. 15, professing to take the Levitical law as the standard, assimilated the prohibitions from consanguinity and affinity to those of England. Incest, or sexual intercourse with persons within the prohibited degrees, was, by the former statute, made a capital crime. As to marriages between bastard relations, the law of Scotland is in a doubtful state; but there is no prohibition against marriage with a relation however near of a person with whom one has had sexual intercourse.

In France, the code Napoléon prohibits marriage between ascendants and descendants lawful or natural, and persons similarly connected by affinity; and in the collateral line between brothers and sisters lawful or natural, and persons similarly connected by affinity. Marriage between uncle and niece, and aunt and nephew, is also prohibited. In Spain and Portugal, the canon-law restrictions are in full force, with the corresponding system of permissive dispensations. In various countries of Europe, as Denmark, no prohibitions from affinity, except in the direct line, are recognized. In most of the United States of America, marriage is allowed between uncle and niece.

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CONSCIENCE See ETHICS.

CONSCIENCE, COURTS OF, IN ENGLAND. These were courts for the recovery of small debts, constituted by special local acts of parliament in London, Westminster, and other trading districts. These courts were also called *courts of requests.* On the establishment of county courts, the courts of C., with a few exceptions, were abolished. See COUNTY COURTS.

CONSCIENCE, HENDRICK, the most fertile and original writer of fiction in Belgium, was born Dec. 3, 1812, at Antwerp, where his father was inspector of the dock-yards, until he became a dealer in waste-paper, old books, etc. C. educated himself by the aid of his father's miscellaneous store of books until his 15th year, when he entered a school, where he was engaged to assist the master in teaching. On the breaking out of the revolution in 1830, C. joined the ranks under Gen. Niellon, and served till 1834, when he left the service, being disgusted with the stricter discipline that was being introdnced. Having failed in all his attempts to obtain employment, he tried his hand at writing, and composed in Flemish the novel, *In het Wonderjaer* 1566 (Ghent, 1837), which, notwithstanding its unprecedented success, left him in debt with his printer. His father refused to do anything for him until he took up some regular employment; and he was thus driven from home in an almost penniless state. At this time, the painter Wappers interested himself for him, and procured him some slight assistance from the king. C. now wrote his *Phantasia,* a collection of fantastic tales, and his celebrated historical novel, *De Leeuw van Vlanderen* (Antw. 1838); but being soon dissatisfied with the small pay and irksome work of the post he had obtained in a government office, he threw up all his avocations, and for a year worked as a gardener. Wappers again befriended him, by inducing the king to give him the place of registrar at the royal academy of painting at Antwerp. In 1845, he obtained the honorary title of agrégé of the university of Ghent, and was appointed to instruct the royal children in Flemish. C. has written numerous tales and novels, most of which have been translated into French and German, and some into English—as, for instance, his *Sketches of Flemish Life,* of which several English translations have been made; *Demon of Gold; Lion of Flanders,* etc. Conscience wrote two historical novels, *Geschiedenis van Graef Hugo van Craenhove* (1845), and *Jakob van Artevelde* (1849), which are esteemed among his best; but his *forte* lies rather in the delineation of simple village life. His *Illustrated History of Belgium* (1845) is interesting as a national work, but of little value as an authority. In 1870, he published *Bavo en Lieveken;* in 1871, *De Kerels van Vlanderen* (1871); in 1874, *De Keusvdes Harten* and *Eene Verwarde Zaak;* in 1875, *Schandevrees;* in 1876, *Gerechtigheid van Hertog Karel.* C. has contributed largely to the revival of Flemish literature. He d. 1883.

CONSCIENCE MONEY is a name given to sums of money sent anonymously to the public treasury, or restitution from persons who have in any way defrauded the government. Such sums are frequently received by the Secretary of the Treasury, accompanied with a brief note of explanation.

CONSCIOUSNESS. This is perhaps the most comprehensive term employed in designating the mind. If it had been used only in its widest signification, there would have been little difficulty in defining it; but unfortunately there are some exceedingly important meanings of a narrower range that are commonly expressed by it, rendering it an ambiguous or equivocal term, and, like all such terms, a source of fallacy and misapprehension.

In the widest meaning, C. is almost identical with mind in action. When we are mentally alive, or performing any of the recognized functions of the mind, we are said to be conscious; while the total cessation of every mental energy is described by the term "unconsciousness," among other phrases. In dreamless sleep, in stupor, fainting, and under the influence of the anæsthetic drugs, we are unconscious; in waking, or rallying into renewed mental activity, we are said to become conscious.

In first learning to write, to cast up sums, or to play on an instrument, our mind is put very much on the stretch; in other words, we are very much excited or highly conscious. When years of incessant practice have consummated the process into a full-formed habit, a very small amount of mental attention is involved; and we may then be said to perform the work all but unconsciously.

We must next advert to the special or restricted meanings of the term, which are those that play the most important part in philosophical discussion. In the first place, we find it applied to denote the mind's cognizance of itself, as opposed to the cognizance or examination of the outer world. Hence, in studying our own minds, we are said to be using C. as the instrument; but in studying minerals or plants, we resort to external observation by the senses. A contrast is thus instituted between C. and observation, which contrast gives to the former word a peculiarly contracted meaning; for, in the wide sense above described, observation is truly an act of consciousness.

In the next place, C. is sometimes identified with belief. We often express a strong affirmation by saying, that we are quite conscious that such a thing is so. It is the strong instinctive tendency of our nature to believe a number of things before we have gone through any large experience of matter of fact. The believing function is a prominent attribute of mental activity. We are scarcely able to feel or act without the operation of belief, or without making assumptions in anticipation of the reality. We believe first, and prove and disprove afterwards. The more intensely we are made con-

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scious, the more strongly we pass into these intuitive convictions. We unhesitatingly believe in the future persistence and universal prevalence of the order of things that we are born into, until such time as our experience gives us a check. Our emotions all produce beliefs in proportion to their strength. Fear makes us believe in coming evil; joy and elation give confidence in coming good. So that it is true, to a certain extent, that the state of belief is engendered along with C., and is stronger as that is stronger; but it does not follow, as is frequently maintained, that to be conscious of every affirmation is to verify it, because our C. cannot be presumed to lie. See COMMON SENSE.

Correct usage, therefore, would dictate the employment of the term in question only in the one sense, in which it is co-extensive with being mentally alive, as opposed to sleep, torpor, insensibility, etc. Anything that renders the mental activity more intense, that increases the whirl of the brain (such as strong pleasures and pains, great interest in anything that is going on, etc.) is designated by the positive term C.; the opposite condition, and also the feebler modes of excitement, are expressed by the negative—unconsciousness. All mere special and restricted applications should be forborne, as introducing confusion into thought, and error into philosophy. The study of our own mind may be expressed by such phrases as "self-consciousness," "introspective attention," and the like. As it is an entire fallacy to talk of C. in general as accrediting doctrines or matters of belief, any acceptation of the word implying this should be avoided.

Points of great importance are involved in the determination of the *conditions* of C., or the circumstances attendant on the manifestation of mental excitement; in other words, the stimulants of our emotional and intellectual wakefulness. The most general and fundamental condition of our becoming conscious, as regards influences external to the mind, is *change*. The even continuance of one impression tends to unconsciousness; and there are a number of facts that show that if an influence were present in one unvarying degree from the first moment of life to the last, that influence would be to our feeling and knowledge as if it did not exist at all. This important point is more fully illustrated under CONDITIONED.

In a work entitled *Contributions to Mental Philosophy*, by Immanuel Hermann Fichte—the son of the renowned Johann Gottlieb Fichte—translated by Mr. Morell (Longmans, 1859), the attempt is made to establish the existence of a preconscious mind, distinct from our conscious life, and not dependent like that upon the bodily organization.

It appears that Fichte considers the power of germination and growth—or that energy, whatever it is, that unfolds the germ and conducts it to a completely formed organization—as a function of the mind or soul; which is almost to revert to the views of the ancient philosophers, with whom the soul was the "vital principle," or the peculiarity that distinguished organized beings from minerals. Aristotle spoke of the soul of plants as well as of animals, or of man. Fichte couples this power of germination with the following things—namely, the instincts; the processes of intelligence that we seem to go through without being aware of the steps, as in the sudden inspirations of men of genius; with all the mysterious phenomena of second-sight, clairvoyance, etc.; and the aggregate of this he erects into a preconscious mind or soul, the contrast of C. as above defined. For the varieties or divisions of our conscious states, see MIND.

CONSCIOUSNESS, DOUBLE. See DOUBLE CONSCIOUSNESS.

CON'SCRIPT FATHERS, a name given to the Roman senators after the expulsion of the Tarquins, when Brutus added 100 to the number of senators. The proper designation was then *Patres et Conscripti*, afterwards abridged to *Patres Conscripti*.

CONSCRIPTION is the system whereby the French—since the year 1795—and some other foreign armies are recruited. It differs essentially from the British and American systems in being compulsory, and, taken for all in all, as a disturbance of the system of employment in all grades of society, is probably the most expensive means of recruitment yet devised (see ARMIES, MODERN). Every Frenchman may be called to enter the army at the age of 20; but those who choose to enlist, as early as 18. He cannot again be called upon to serve. According to the law of 1882, as modified by later acts, the term is for 3 years in the active army, 10 in the active army reserve, 6 years in the territorial army (militia), and 6 in the territorial reserve. This brings the conscript to 45 years of age, when his liability to service ceases. The law of 1872, reorganizing the French army, forbids the providing of substitutes by conscripts. An account is kept of the number of youths in France who reach the age of 20 in each year. All those are exempt from conscription who are under 5 ft. 2 in. in height; or have any natural infirmities unfitting them for active service; or are the eldest of a family of orphans; or are the only sons of widows, or of disabled fathers, or of fathers above 70 years of age. Students in certain institutions for higher education are required to serve only one year, on condition that they reach a certain rank, and complete their studies before the age of twenty-six years. Culprits and felons are not allowed to enlist. The law of 1872 and later statutes, making military service obligatory on all Frenchmen (save in the above cases) have assimilated the French army system to that enforced in Prussia since 1813. See DRAFT RIOTS.

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CONSECRATION is the act of solemnly dedicating a person or thing to the service of God. It is one of the most widely spread religious ceremonies of the ancient world, being practiced in India, Egypt, Chaldea, Judea, Greece, Rome, Britain, and other countries. In the Old Testament we read of the C. or dedication of the first-born, both man and beast, to the Lord; also the dedication of the Levites, of the tabernacle and altar, of fields, houses, walls, etc. This custom, at least so far as regarded places and things, did not pass immediately from Judaism to Christianity, for the latter being more or less a persecuted religion until the time of Constantine, could not venture to indulge with safety in any public ceremonialism; but no sooner was the sword of persecution sheathed than, according to Eusebius, "the sight was afforded us, so eagerly desired and prayed for by all—the festivals of dedications and consecrations of the newly-erected houses of prayer throughout the cities." Eusebius himself describes the C. of the church built at Jerusalem by Constantine, 335 A.D. The practice of consecrating religious edifices has continued to the present day in the Roman and Anglican churches. The forms were at first very simple, consisting chiefly of prayer, the celebration of the Lord's supper, thanksgiving, and benediction; but they afterwards became more numerous and imposing, whilst, also, the bishops and higher dignitaries assumed the power of consecrating entirely to themselves. An important part of the C. of Roman Catholic churches consists in the deposition of relics for a time upon the altar. In the English church, each bishop is left to his own discretion as to the form of C. to be adopted, but that most generally used is the form sent down by the bishops to the lower houses of convocation in 1712. The English church also retains the C. of burying-grounds.

C. OF ARCHBISHOPS AND BISHOPS.—According to a canon of the first Nicene council, there must be four, or at least three bishops present at the C. of an archbishop or bishop. The form used in the church of England is that prepared in the reign of Edward VI. The Romanists deny the validity of English orders generally, as derived from heretical and improperly consecrated bishops. They had an old story, refuted by their own historian Lingard, which is known as that of the "Nag's Head consecration." According to this story, archbishop Parker was consecrated at the Nag's Head tavern, Cheapside, by one of the Protestant bishops present laying a Bible on his head, and saying: "Take thou authority," etc. Lingard thus relates the facts: "Barlow, the deprived bishop of Bath, and Hodgkins, once suffragan of Bedford, who had both been consecrated according to the Roman Catholic pontifical, in the reign of Henry VIII., and Scorey, the deprived bishop of Chichester, and Coverdale, the deprived bishop of Exeter, who had been both consecrated according to the reformed ordinal, proceeded to confirm the election of Parker, and then to consecrate him after the form adopted in the reign of Edward VI. A few days later, Parker, as archbishop, confirmed the election of Barlow to the see of Chichester, and of Scorey to that of Hereford, and with these for his assistants, consecrated all the other prelates elect." The C. took place in the chapel at Lambeth, as appears by the archbishop's register, and Lingard says that there is nothing to countenance the supposition of the entry being other than authentic. The story probably arose from a fact, mentioned by Fuller, that the commissioners who confirmed Parker's election dined at the Nag's Head, a tavern much frequented by the country clergy.

CONSECRATION OF THE ELEMENTS. See LORD'S SUPPER.

CONSECUTIVE, a term in music, applied to octaves and fifths, which, according to the rules of harmony, are strictly forbidden.

CONSEGUIANA, a volcano of Nicaragua, occupies a promontory on the s. side of Fonseca gulf, about 10 m. distant from the Pacific ocean. The crater, at an elevation of about 4,000 ft. above the mean level of the surrounding country, is about half a mile across, while its interior descends perpendicularly to a depth of 200 feet. In 1835, a fearful eruption, the last on record, converted into a waste a large tract of grazing land.

CONSENSUAL ACTIONS. See NERVOUS SYSTEM.

CONSENT, in law the agreement of minds, accord of purpose. Consent is at the basis of all legal contracts and agreements; without it they have neither force nor validity. Consent presupposes a deliberate and reasonable act of the mind, and to it are requisite an intelligent knowledge of the circumstances and the capacity, physical and mental, to consent. Accordingly, insane persons, idiots, and children are without the legal capacity of consent either in contracts or in crime. As regards intoxication, it has been held that a contract entered into by a man who is drunk is void for lack of his reasonable consent; the fact that he was only slightly under the influence of intoxicants would not, however, void the contract; the court would act in accordance with common sense and the special circumstances of the case. The bearing of consent upon the contract of marriage has been widely discussed and is of extreme importance. Although it is true that marriage differs from ordinary contracts in some essential and peculiar points, it is nevertheless a contract, and it derives its legal force, as do other contracts, from the consent and agreement of minds of the parties to it. The common law or statutes have, to be sure, insisted that either a religious ceremony or a public acknowledgment of the contract before an authorized agent of the law should take place. But the marriage itself depends for its real validity on the consent of the parties, and the ceremony or public declaration is but the evidence of such consent demanded by considerations of

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public policy and morality. The importance of mutual consent as the basis of the marriage relations has been constantly and very widely recognized by courts and legislatures; some decisions, especially in New York state, seem to hold the mere acknowledgment, not formally, but incidentally, and sometimes even implied, by the parties that they considered themselves as man and wife, is sufficient to constitute a valid marriage It follows from a well-established principle that consent constitutes marriage (*consensus, non concubitus, facit matrimonium*), that an actual contract of marriage, though not followed by the living together of the persons, is valid, while on the other hand, when either party is incapacitated, as by insanity, from giving a legal consent, the marriage will not be held valid under any circumstances. It is an acknowledged legal maxim that "Consent takes away error'—that is, the effect of an error in legal procedure may be removed by agreement of both parties to the litigation. This, however, applies to formal matters; substantial rights cannot be destroyed, though they may be temporarily waived by such consent.

CONSEN'TES DII, the twelve chief Roman deities: Jupiter, Apollo, Mars, Neptune, Mercury, Vulcan, Juno, Vesta, Minerva, Ceres, Diana, and Venus.

CONSERVA'TION OF FORCE. See FORCE.

CONSERVATIVE. See WHIG AND TORY.

CONSERVATOIRE, or CONSERVATO'RIUM (Ital. *conservatorio*), a name given by the Italians to schools instituted for the purpose of advancing the study of music and maintaining its purity. In the earliest times, these schools were partly attached to benevolent institutions and hospitals; others, again, were supported by opulent private individuals. They were originally intended for foundlings, orphans, and the children of poor parents. Some trace their origin to St. Ambrose, bishop of Milan, in the 4th c., or St. Leo, who flourished in the 5th. The scholars, male and female, all received free board, lodging, clothing, and were taught to sing and play. Extra boarders were also admitted on paying a fee. In Naples, there were at one time three such schools, while in Venice there were four, expressly for females. In 1818, the Neapolitan conservatoires were reduced to one, under the name of Real Collegio di Musica. The Venetian conservatoires shared in the downfall of the Venetian republic. A new grand C. was founded at Milan in 1808, which still exists. In France, the necessity of a school for educating singers gave rise to the *Ecole Royale de Chant et de Déclamation*, in 1784. During the French revolution, in consequence of the scarcity of instrumental musicians for the army, the government decreed the erection of an institut national de musique, in 1793, which was changed into the present establishment in 1795 under the name of the C. de Musique. The yearly expenses of this C. were fixed at 240,000 francs, the number of masters was 115, and the pupils of both sexes amounted to 600. In 1802, the expense was reduced to 140,000 francs, with a corresponding reduction in the number of masters and pupils. The course of study is divided over 66 different classes, in which all appertaining to music and also declamation is taught by the best masters. The elementary works published by this C. for all instruments are known over the whole world. Next to the conservatoires of Italy and France come those of Warsaw, Prague, Brussels, and Vienna, which last was established in 1816. In 1842, a C. was established in Leipsic, under the auspices of Mendelssohn. There are also conservatories in Cologne, Munich, Stuttgart, Berlin, etc., the royal college of music in London (chartered 1882), and several of importance in the U. S.

CONSERVATORS OF THE PEACE. The sovereign, by virtue of his office, is the principal conservator of the peace in British realms. The function which he thus possesses he may delegate, thus constituting a subject a conservator of the peace. The office, however, must always be exercised in the sovereign's name, and it is for this reason that we always speak of the king's or of the queen's peace. Several high officers of the crown, the chancellor or keeper, the lord high steward, the lord marshal, and the lord high constable, when there are such officers, all the justices of the queen's bench, the master of the rolls, are C. of the P. throughout the whole kingdom, and may commit breakers of the peace or bind them in cognizances anywhere. Other judges possess this power only within the limits of their own jurisdiction. The sheriff and coroner are C. of the P. within their respective counties, and constables, tithing-men, etc., within their jurisdictions. But in addition to these official conservators, others were appointed expressly for the purpose, previous to the appointment of justices of the peace, in the reign of Edward III. Their powers were far inferior to those of the justices, being confined exclusively to the function which the name indicates.

CONSERVA'TOR OF THE STAPLE. See CAMPVERE.

CONSERVATORY, in horticulture, a house for the cultivation of tender exotic plants, which, although requiring protection from frosts, and a little assistance of artificial heat, do not need the heat of the hot-house or stove. The only distinction between a C. and a green-house is, that in the former the plants grow in borders of earth; in the latter, they are in pots; and these two characters are often combined. The structure, management, etc., are much the same for the C. as for the green-house; but in the warmer parts of the country, the roof and even the sides are with advantage made capable of being removed in summer. In all situations, the most free and frequent ventila-

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tion is requisite. A C. is often attached to a mansion, so as to communicate directly with one or more of the apartments, instead of being placed in the garden.

CON'SERVES are described by Cooley in his *Cyclopædia of Practical Receipts*, to be "recent vegetable matter, as flowers, herbs, roots, fruit, and seed, beaten with powdered sugar to the consistence of a stiff paste, so as to preserve them as nearly as possible in their natural freshness." C. are made by druggists as vehicles for more active medicines, and by confectioners as sweetmeats.

CONSHOHOCK'EN, a borough in Montgomery co., Pa., on the Schuylkill river and the Philadelphia and Reading, and the Pennsylvania Co.'s railroads; 13 m. n.w. of Philadelphia. It has manufactories of cotton, woolen, and worsted goods, carpets, gas and water pipe, sheet and bar iron, and surgical instruments, and contains waterworks, gas and electric lights, high school, public library, several churches, national banks, etc. Pop. '90, 5470.

CONSIDÉRANT, VICTOR-PROSPER, a French socialist, was b. in 1808 at Salins, in the department of Jura. After being educated at the polytechnic school at Paris, he entered the army, which, however, he soon left to promulgate the doctrines of Fourier (q.v.). After the death of his master, C. became the head of the societarians, and undertook the management of *The Phalanx*, a review devoted to the maintenance and spread of their opinions. Having gained the support of a young Englishman, Mr. Young, who advanced the required sum of money, C. established, 1832, on a large estate in the department Eure et Loire, a socialist colony or *Phalanstère;* but the experiment failed, and with it *The Phalanx* fell to the ground. However, a new organ of co-operative doctrine, the *Démocratie Pacifique*, was soon established, and was edited by C., who displayed great zeal, perseverance, and ability in his hopeless battle with the laws of society as now constituted. Among his numerous writings, the chief is the *Destinée Sociale*, dedicated to Louis Philippe. In 1849, C. was accused of high treason, and compelled to escape into Belgium, whence he emigrated to Texas, returned to Brussels, and again went to Texas, where he founded a societarian community, *La Réunion*, which proved a failure. C. returned to France in 1869, and d. in 1893. See COMMUNISM.

CONSIDERATION, in the law of contracts, that which is done, or given, or permitted, or refrained from by on party to the contract in compensation for an advantage derived by him from the other party. A consideration is essential to a valid contract. A mere promise made without a consideration is called by lawyers a naked promise (*nudum pactum*) and on it suit will not lie. Such a promise, even though made in writing, is not a valid legal contract, but by special statutes in the United States negotiable paper and sealed contracts are presumed to be founded on valid consideration; certainly this will be the case when they have passed into the hands of third parties, such as *bona fide* purchasers or creditors. The consideration may be either good or valuable; by the former in law is meant that the promise is founded on natural affection, relationship, and the like causes; a valuable consideration is one of a property nature, whether pecuniary or otherwise tangible, or a positive advantage of any kind. A valuable consideration need not be in the form of a direct benefit to the contracting party, but may be something injuring or causing loss or prejudice to the second party of the contract. A service rendered gratuitously is not a consideration which will support a promise to pay for it made subsequently to the act; thus, where one man voluntarily rescues another's property from loss and the second party promises to pay therefor, that promise cannot be sued upon even though made in writing; the law would not see in the consideration either an express or implied contract. So a promise to reward another for performing his legal duty cannot be sued upon; thus, if a taxpayer promises to pay a policeman for guarding his house it is held that, it being the policeman's duty to guard public property, there has been no real consideration and no legal contract. The simple existence of a moral duty is not in the eye of the law a consideration; but if there has been a legal duty to perform an act which has become obsolete, and if there be also a moral duty to carry out what was formerly the legal duty, then the two jointly will constitute a sufficient consideration; thus, if a debt has been barred by the statute of limitations or by the discharge of the debtor under insolvency proceedings, and if thereafter the debtor admit his moral obligation to pay the debt and promise so to do, suit will lie. In the nature of the case the considerations in a contract must be mutual; it is not necessary, however, legally speaking, that they should be equal in value; the law will consider only the questions whether the contract is free from fraud or force, and whether the parties are competent to contract. Internal evidence, however, of an "unconscionable bargain" will be considered as tending strongly to taint the contract with fraud. The consideration is said to fail when that which was to be given or done turns out not to have been in existence at the time the contract was made; thus, if one purchases a horse and it is discovered that at the time the contract was made the horse had died, the consideration of the contract has failed and the purchaser can recover the sum paid. Every contract based on an illegal consideration, is void; if the consideration be illegal only in part, still the contract is void unless it is possible to separate the illegal and the legal parts so that the one may be thrown out as void and the other enforced. Express considerations are those stated in so many words in the contract, whether oral or written.

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CONSIGNMENT, in mercantile law, is the term applied to goods which are placed in the hands of an agent or factor, for sale, or for some other specified purpose. Where either the consigner or consignee becomes bankrupt, questions of nicety often arise regarding ownership, and the consequent rights of the parties and their creditors.

CONSISTORY (Lat. *consistorium*), properly, a place of assembly, but in the later Latinity the word came to signify the particular place where the privy council or cabinet of the Roman emperor met, and after the time of Diocletian and Constantine, the council itself. The assessors of this council were partly the ordinary members (*comites consistoriani*), such as the imperial chancellor and seneschal, partly extraordinary; and their duty was to deliberate on all the important affairs of legislation, administration, and justice. The *form* of the imperial C. passed over into the early Christian church. The bishops established their consistories; and the highest ecclesiastical court, composed only of cardinals (the college of cardinals), which meets in the Vatican, under the presidency of the pope, to determine all such matters as the appointment of cardinals, archbishops, bishops, etc., still bears this name, as do also the private councils which the pope can call at his pleasure. The Protestant church of Germany was induced to perpetuate the consistorial courts principally because the episcopal authority passed into the hands of territorial princes (Ger. *Landesfürsten*) not familiar with ecclesiastical affairs. The first Lutheran C. was established at Wittenberg in 1542. After 1555, when the peace of Augsburg secured the recognition of the Protestant religion, similar consistories were gradually formed in other places. The Lutheran consistories exercise a supervision and discipline over religion and education, over the clergy and the schoolmasters, and examine the theological candidates on their trials for license and ordination. They have the regulation of divine worship, the administration of church property, and at an earlier period possessed a certain jurisdiction in regard to marriage.—In the French Protestant churches, the C. possesses a more restricted jurisdiction than in Germany. It exercises authority over a *circonscription*—i.e., a division of the church containing 6,000 souls—and is composed of all the pastors of the *circonscription*, together with from 6 to 12 lay-elders elected by a certain number of the people. In that portion of the French Protestant church which has adopted the Augsburg confession, the authority of the French monarch is more recognized than in the reformed church, for it has a *consistoire général*, composed of delegates, lay and clerical, of the various *circonscriptions*, the president of which is a layman nominated by the emperor.—In England, the word is used to denote the court Christian, or spiritual court. Every archbishop and bishop has a consistorial court, held either in his cathedral or other convenient place, before his chancellor or commissary for ecclesiastical causes. In Scotland, the consistorial courts have lapsed into the commissary courts. See COMMISSARY.

In the United States C. is the name of the body of officials in each local church of the "reformed" denominations (Dutch or German).

CONSOLATION CUP, the name given to the cup offered at the conclusion of an athletic contest, for which only those may compete who were defeated in the preceding trial.

CONSOLA'TO DEL MA'RÉ. See MERCANTILE LAW.

CON'SOLE (Fr.), in architecture, a projection resembling a bracket, frequently in the form of the letter S, used to support cornices, or for placing busts, vases, or figures on. Consoles were often richly ornamented in the under part. See BRACKET, CANTALIVER.

CONSOLIDA'TION ACTS. In order to secure uniformity in acts of parliament having reference to public undertakings, and to avoid the necessity of repeating, in each special act, the clauses usually introduced into such acts, the device has been adopted of consolidating or combining all these provisions in one act having reference to the particular kind of undertaking.

CON'SOLS, a contraction of consolidated annuities. In incurring the English debt, government borrowed money at different periods on special conditions, being generally the payment of an annuity of so much per cent on the sum borrowed. Great confusion arose from the variety of stocks thus created, and it was thought expedient to strike an average of their value, and consolidate them into one fund, kept in one account at the bank of England. The consolidated annuities' act was passed in 1757.

CONSOMMÉ (Fr.), a strong, clear soup, containing the nutritive properties of the meat, extracted by long, slow cooking. See SOUP.

CON'SONANCE, in music, a term applied to combinations of sounds, whose vibrations when heard together so satisfy the ear that no other sound is wished for, or expected to follow. The more or less satisfying effect of C. depends on the greater or less simplicity of the interval formed by the combined sounds. Intervals whose relative vibrations can be expressed by numbers from 1 to 6, are considered consonant; while those which can only be expressed by the higher numbers, not a duplication of the lower, as 7, 9, 11, 13, etc., are called dissonant. Sounds vibrating as 1 : 1, are unison; as 1 : 2, produce the octave; as 2 : 3, the fifth, which inverted becomes 3 : 4, the fourth; as 4 : 5, the major third, which inverted becomes 5 : 8, the minor sixth; and 5 : 6, the minor third, which inverted becomes 6 : 10, or 3 : 5, the major sixth. Consonant intervals are therefore the third, fourth, fifth, sixth, and octave; from which it follows that there is only one consonant fundamental chord in music, viz., the common chord, or *trias harmonica perfecta*, being a bass note with its third, fifth, and octave, which inverted

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produces the chords of the 6th and the $\frac{4}{3}$. See CHORD. The ancient Greeks admitted of still fewer consonances in their system of music, as they treated the third and sixth as dissonances; a proof that their system of harmony was not the same as ours. Their name for C. was symphony, and for dissonance, diaphony. Early in the middle ages, only the octave, fifth, and third were treated as consonances. Franco of Cologne was the first who divided C. into perfect, semi-perfect, and imperfect. In the writings of Marchettus, and of Joannes de Muris, in the first half of the 14th c., we find already the important rule, that two perfect consonances following in similar progression are not allowable. The study of the C. was carried still further in the 16th c. by Zerlino, who ascertained the true mathematical proportions of the major and minor thirds. Notwithstanding this, Palestrina, up to the end of the same century, and, long after him, all who wrote in the same style, carefully avoided the use of the third in the final chord, finishing always with the perfect consonances according to Franco. Of late years, the importance of the C. has attracted the attention of many eminent theorists in music, as well as philosophical writers of undoubted judgment, some of whom do not hesitate to consider the interval of the seventh a C., because it differs from other dissonances in not requiring preparation. There cannot be a doubt that the chord of the seventh, C, E, G, and B flat, considered individually, and not in connection with other chords, is as euphonious and satisfying as the common chord; and when these intervals are placed at the distance from the fundamental note they harmonically arise at, the consonant nature of the combination is still more obvious. A scientific organ-builder in Scotland has long been in the practice of introducing the seventh as an interval in his mixture stops, forming with the fundamental stops a union of sound decidedly consonant, and producing a remarkably brilliant effect. The exact limit of C., or the point where dissonance begins, seems not definitely fixed, if fixed it can be. To define C. to be agreeable sounds, and dissonance to be the reverse, as some do, is clearly absurd, because they both essentially belong to harmony or concord, or, as the Germans more properly call it, *Die Kunst des Wohlklangs*, in which there can be nothing absolutely discordant.

A perfect C. causes a musical effect known as Tartini's grave harmonic, it having been first observed by the eminent violinist of that name. Along with any two musical notes sounded continuously, there may be heard (if the notes are in accord) a third deeper tone, caused by that number of vibrations which is the greatest common measure of the numbers producing the primary notes, and upon this Tartini founded his theory of harmony (now obsolete), by assuming that the grave note is the natural base of the chord producing it. The note thus sounded may be too deep to be appreciated by the uneducated ear, although felt as a succession of beats, and these should not be confounded with the "beats" resulting from the sound of a discordant interval, a species of jar or flutter known to tuners as the consequence of the *imperfection* of a consonance. The subject is treated at length by Prof. de Morgan in a paper published in the transactions of the Cambridge philosophical society, 1858.

CONSONANT. See LETTERS.

CONSORT, literally, one who throws in his lot with another. In English constitutional law, the term is applied to the husband or wife of the reigning sovereign, viewed not in a private but a public capacity, as participating to a certain limited extent in the prerogatives of sovereignty. The extent of these prerogatives in the case of a queen C. are stated by Blackstone. She is, he says, a public person, exempt and distinct from the king, and "not, like other married women, so closely connected, as to have lost all legal or separate existence so long as the marriage continues." For this, sir Edward Coke gives the curious reason, that "the wisdom of the common law would not have the king (whose continual care and study is for the public, and *circa ardua regni*) to be troubled and disquieted on account of his wife's domestic affairs." In addition to this peculiarity in her domestic position, the queen C. enjoys several exemptions and minute prerogatives. She pays no toll, and is not liable to amercement in any court. But where no such exemption is expressly recognized by law in favor of the royal C., she is on a footing of equality with other subjects, and the privileges which the title conveys are chiefly those of precedence, and belong to court etiquette. Up to the year 1857, the husband of queen Victoria possessed no distinctive English title, and no place in court ceremonial except such as was conceded to him by courtesy. In that year, the title of prince C. was conferred upon him by letters-patent.

CONSPIRACY, a combination between two or more persons to perpetrate an unlawful act. See COMBINATION.

CONSPIRACY BILL. In consequence of an attempt to assassinate the emperor and empress of the French whilst going to the opera on the evening of the 14th Jan., 1858, by the Italian refugee Orsini and others, by means of explosive shells partly manufactured in England, a bill was introduced into parliament by lord Palmerston, declaring conspiracy to murder, which the law of England had hitherto treated as a misdemeanor, to be a felony, punishable with penal servitude, and applying that provision to all persons whether English or foreign, and to all conspiracies to murder wherever intended. In place of being regarded merely as a piece of law reform, the C. B. obtained a political character partly from a dispatch from the French minister, count Walewski, demanding some such change in the law, and partly from expressions contained in certain addresses

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which were presented to the emperor by the French army, and published in the government organ, the *Moniteur*, which were regarded as insulting to England. The ministry were accused of truckling to France; and though on the motion for leave to bring in the bill they had a majority of 200 (299 against 99), an amendment by Mr. M. Gibson on the second reading, virtually amounting to a vote of censure, was carried by a majority of 19 against them (234 to 215).

CONSTABLE (Lat. *constabulus*). Whether this officer was called originally *comes stabuli*, the count of the stable or master of the horse (as alleged by Ducange), or the *koning-stapel*, staff and stay of the king (as Coke, Selden, and others, with less reason, have maintained), the C., both in France and England, was a military personage of the very highest rank. The C. of France rose gradually in importance from the comparatively modest position of an officer of the household, till at last he became, *ex officio*, the commander-in-chief of the army in the absence of the monarch, the highest judge in military offenses and in all questions of chivalry and honor, and the supreme regulator and arbitrator in all matters connected with tilts, tournaments, and all martial displays. The office of C. is traced back by Anselme to Alberic, who held it in 1060; but the first C. of France who appeared at the head of an army was Matthew, the second seigneur de Montmorency. The office was suppressed by Louis XIII. in 1626. Among the offices of the ancient monarchy which were restored by Napoleon for mere purposes of state, that of C. was one. His brother, prince Louis Napoleon, afterwards king of Holland, was created grand C., the vice-C. being Marshal Berthier. The office was again abolished on the restoration of the Bourbons, and has not since been re-established. But besides the C. of France, almost all the great vassals of the crown had constables who filled analogous offices at their minor courts. There were constables of Burgundy, of Champagne, and of Normandy; the latter of whom may be regarded as the progenitor of the C. of England.

Shortly after the conquest, a lord high C. of England appears, with powers and privileges closely corresponding to those of the C. of France (13 Rich. II. st. 1. c. 2). His position as judge of the court of chivalry, in conjunction with the earl-mareschal, and the limitation of his power, which followed on the statute 13 Rich II. c. 2, are explained under CHIVALRY, COURT OF. The office was abolished by Henry VIII. on the attainder of Edward Stafford, duke of Buckingham; and a lord high C. is now appointed only on the occurrence of great state ceremonies, e.g., a coronation, The high C. of Scotland was an officer very similar to the C. of France and England. After the rebellion, the offices of the inferior constables dependent on the high C., such as the C. of the castle (q.v.), were abolished, but that of the high C. himself was expressly exempted, and still exists in the noble family of Errol. The privileges attaching to this office are now entirely honorary; but in virtue of it, the earl of Errol is said to be the first subject in Scotland after the blood-royal; and on the occasion of the visit of king George IV. to Edinburgh, the then earl was allowed to take precedence of the possessors of all other hereditary honors. The present earl of Errol is the 22d high C. of Scotland.

CONSTABLE OF A CASTLE was the keeper or governor of a castle belonging to the king or to a great baron. These offices were frequently hereditary; thus there were constables or hereditary keepers of the tower, and of the castles of Dover, Windsor, etc. —CONSTABLE OF THE HUNDRED, and CONSTABLE OF THE VILL, were the predecessors of the high and petty constables of later times. The statute of Winchester (13 Ed. I. st. 2, c. 6), by which the office of high constable is usually, though probably not correctly, said to have been first introduced, ordains that in every hundred or franchise there shall be chosen two constables, to make the view of armor, and to see to the conservation of the peace.

In this country a C. is an inferior officer of the law whose duty it is to aid in keeping the peace, to execute the processes of justices or other lower courts and to perform other duties specially committed to him by the statutes, such as making arrests for offences committed in his presence, arresting without warrant on reasonable suspicion of felony, taking charge of juries, attending upon courts, and the like. In the United States, constables are usually officers of towns and villages elected in the same manner as the other local officers. The office of high constable formerly existed in New York, Philadelphia, and other large cities, but has generally, if not in all cases, been superseded by that of chief of police. In France, England, and Scotland the office of constable was in the Middle Ages one of high dignity and power. At one time he possessed almost supreme military control, and was regarded as the conservator of national peace. The origin of the word is probably from the Latin *comes stabuli* (literally count of the stable—that is, master of horse). It was in France that the office increased in dignity until the constable became the military representative of the king and supreme judge of all matters relating the chivalry. In the early part of the seventeenth century the office was suppressed, but it was one of those restored by Napoleon Bonaparte to add to the grandeur of his military system. In England in the Middle Ages the constable occupied a corresponding position. Henry VIII. abolished the office; it continued, however, to exist in Scotland until the reign of George III., and a temporary incumbent of the office is still specially appointed on the occasion of a coronation. In England a distinction is made between high constables, who are intrusted with

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the keeping of the peace within the hundreds or franchises, and petty constables, who have like duties assigned them within the limits of a town or parish. Of recent years, however, the authority and power of the high constables has greatly decreased. Under the present system each county has a county constabulary under the charge of a head officer called the chief constable. In the United States, as well as in England, special constables may be appointed to serve on particular occasions by justices of the peace or other officers authorized so to do by the statutes. The general object of appointing special constables is to assist in preserving the peace, or to execute warrants on occasions where more than the ordinary force of officers becomes necessary. Any citizen may be thus authorized to act as a special constable and in general if called upon is legally bound so to act.

CONSTABLE, ARCHIBALD, 1774–1827; widely known as a publisher of books in Edinburgh, Scotland. He was a bibliopolist by nature, and before coming of age went into business on his own account. He took great interest in Scottish literature, and the elegance of his publications soon brought him prominently into notice. Among publications wholly or partially under his care were the *Scot's Magazine* and the *Edinburgh Review*. His acquaintance and friendship with sir Walter Scott is well known, and nearly all the works of the great novelist came to the people through Constable's press. Among his latest effort were the purchase and enlarging of the *Encyclopædia Britannica*, and the starting of *Constable's Miscellany*, a series of original standard works to be issued in cheap form. This was continued but a short time, and the firm became heavily in debt and failed in 1826, leaving Walter Scott largely involved in their liabilities.

CONSTABLE, JOHN, an English landscape painter, was born in Suffolk, England, June 11, 1776. His early work was figures, his first landscape being exhibited in 1802. He received at first more recognition in France than in England, the modern French school of landscape painting having derived much from him. Some of his works are in the Louvre and two in the Metropolitan Museum of Art in New York City. He was made a Royal Academician in 1829. Among his pictures are "Stratford Mill," "The Hay Cart," "Salisbury Cathedral," "The Lock Valley Farm" and "The Cornfield." He died Mar. 30, 1837.

CONSTANCE, LAKE (called by the Germans *Bodensee* or *Bodmansee*, from the old castle of Bodman—the *Lacus Brigantinus* of the Romans), lies on the north side of the Alps of Switzerland, and forms a meeting-point of the five territories—Baden, Würtemberg, Bavaria, the Tyrol, and Switzerland. It has an elevation variously estimated at from 1250 ft. to 1305 ft. above the sea. Lake C. is traversed by the Rhine from e. to w.; its greatest length is about 44 m., utmost breadth 9 m., and depth 964 feet. It is divided into the upper and lower lakes, the latter of which extends from Constance to Stein. Anciently, the lake was more extensive toward the s. than now. In the 4th c., it is said to have extended as far as Rheineck, now some miles distant from the shore. The shores are formed by hilly lands, with low tracts at the mouths of the Rhine and smaller rivers. Cornfields, vineyards, pastures, orchards, and wooded declivities, with here and there the ruins of old castles interspersed, surround the lake. The water has a dark-green hue, often rises suddenly some 10 or 12 ft. during a thaw, and rolls in high waves during the prevalence of a strong s., n.w., or e. wind. Without visible cause, it sometimes rises and falls to a considerable degree. In one hour, in 1770, it rose between 20 and 24 feet above the ordinary level. It is seldom frozen, except in very severe winters. The lake contains sixty kinds of aquatic fowl; twenty-five species of fish, including fine salmon and salmon-trout; and several species of shell-fish. Since 1824, steam-navigation has added to the facilities of commerce across the lake, and its commercial importance has been greatly increased by the opening of a railway from Friedrichshafen, by Ulm and Stuttgart, to Heilbronn.

CONSTANCE, or KOSTNITZ (anciently *Constantia*), a city of Baden, once a free imperial city, is situated on the s. shore of the lake of Constance, at the place where the Rhine connects the upper and lower lakes together. C. is one of the most ancient towns in Germany, but it is very much decayed, its pop., once 40,000, being at the census of Dec. 2, 1895, only 18,680. Its cathedral was erected in the 11th century. C. is notable in history for the ecclesiastical council held in 1414-18. The object of the council of C. was to put an end to the disorders in the popedom and in the election of popes, and also to prevent the spread of the doctrines of Huss. There assembled, with the emperor Sigismund and Pope John XXIII., 26 princes, 140 counts, more than 20 cardinals, 7 patriarchs, 20 archbishops, 91 bishops, 600 prelates and doctors, and about 4,000 priests. Of the three rival popes, John XXIII., Benedict XIII., and Gregory XII., the first two were deposed, and the last abdicated, and Martin V. was elected in their stead. Huss and Jerome of Prague were condemned and burned. The emperor was disappointed in his hope of a thorough ecclesiastical reform, and the council of Basel was afterwards called to carry on the work which the council of C. had failed to accomplish. The hall in which the council met is now the market-hall of Constance. C. has manufactures of cotton goods, carpets, chemicals, etc., and the cultivation of vineyards and gardens employs a considerable number of the inhabitants.

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CONSTANS, FLAVIUS JULIUS, 320–350; second son of Constantine the Great, and emperor of Rome, after having defeated and killed his brother (Constantine II.) at the battle of Aquileia in 340. He was rapacious and profligate, but he protected the Christians, and closed many of the pagan temples. His reign became so obnoxious that his troops in Gaul revolted, and sent emissaries to slay him, which they did while he was flying towards Spain.

CONSTANT is the name given, in mathematical analysis, to a quantity which remains the same for all cases of the problem, in opposition to a variable. Thus, in questions about the fall of bodies in given times, the force of gravity is a constant quantity. In the integral calculus, the name of constants is given to those quantities which, after integration, are annexed to the integral.

CONSTANT, JEAN JOSEPH BENJAMIN, artist, was born in Paris, June 10, 1845. He studied under Cabanel, and his first exhibition in the Salon in 1869, "Hamlet and the King," was purchased by the French government. He soon after turned his attention to oriental subjects, and in these he has achieved an enviable reputation. His best-known works are "Samson and Delilah" (1872); "Prisoners in Morocco" (1875); "Mahomet II.," a picture of colossal size, afterward exhibited in the Exposition of 1878 (1876); "The Harem" (1878); "The Favorite of the Emir" (1879); "The Last Rebel" (1880); Herodiade" (1881); "The Day after a Victory in the Alhambra" (1882); and "The Vengeance of the Chérif" (1885), which is in the Carcassonne museum. Three decorative panels by him, "Literature," "The Academy of Paris," and "Science," are in the New Sorbonne. In 1876 he also painted a portrait of M. Emmanuel Arago, whose daughter he married in 1878. His work is characterized by a powerful realism, melodramatic feeling, and strong effects of color. He is one of the most successful and popular of contemporary French artists. He received medals in 1875 and 1876, but in 1889 he refused a first class medal at the Paris Exposition; was decorated with the Legion of Honor in 1878; and was elected a member of the Academy of Fine Arts in 1893. He has several times visited the United States, painting portraits, many of which are in N. Y. and other cities.

CONSTANT DE REBECQUE, HENRI BENJAMIN, one of the most distinguished political writers and orators of France, was b. at Lausanne on the 25th Oct., 1767. Educated in a German college, he afterwards spent some time at Edinburgh university, and here he is supposed to have imbibed those ideas of political freedom which guided him through life. In 1796, he published in Paris a pamphlet on the government then existing, which brought him into note; and three years later, he was placed on the "tribunat" by Napoleon, who, however, two years after, dismissed and banished him for the spirit he displayed in resisting the first consul's encroachments on liberty. During his banishment, he traveled for some time with Madame de Staël, and afterwards settled in Germany. In 1813, he published his celebrated pamphlet, *On the Spirit of Conquest and Usurpation*. In 1814, he returned to Paris, where he wrote several pamphlets in favor of constitutional liberty, which he maintained was enjoyed under Louis XVIII. Napoleon's government he described as a "government of Mamelukes," and the emperor himself as "a Genghis khan." Yet during the hundred days he became a councillor of state, and assisted in framing the *Acte Additionnel*. In 1819, he was elected a deputy, became ultimately leader of the opposition, and in this capacity gained unbounded popularity. C. de R. was a true patriot. He loved liberty better than monarchies or mobs, and therefore, while he opposed the despotic measures of the government of Charles X., he deplored the revolution of July, 1830. He died Dec., 1830. As a public speaker, C. de R. was in his day the clearest and most persuasive advocate of constitutional principles in France. As a political writer, he was even fully more effective than as a speaker. Among his works may be mentioned *Discours Prononcés à la Chambre des Députés* (2 vols., Par. 1828); the *Cours de Politique Constitutionnelle* (4 vols., Par. 1817–20, 2d ed., 1838), in which are collected his minor works on representative government. Among his most ambitious works are *Mémoires sur les Cent Jours* (Par. 1820); *De la Religion considérée dans sa Source, ses Formes, et ses Développements* (5 vols., Par., 1824–31), to which posthumous work his *Du Polythéisme Romain, considéré dans ses Rapports avec la Philosophie Grecque et la Religion Chrétienne*, forms a kind of supplement.

CONSTANTI'NA, a t. of Spain, in Andalusia, situated in a mountainous district, about 40 m. n.n.e. of Seville, to which city it supplies much fruit and ice. It has manufactures of leather and soap, distilleries, flour-mills, etc. Pop. '87, 11,953.

CONSTANTINE, the capital of a province of the same name (the easternmost province of the French colony of Algeria), is situated on a hill with flat summit, three sides of which are washed by the Rummel, flowing through a deep and narrow ravine, and the fourth is connected by a natural mound with the surrounding mountains. Lat. 36° 22′ n., long. 6° 37′ east. It is 830 ft. above the river, and 2,162 ft. above the sea. It is surrounded by walls constructed by the Arabs out of Roman sculptured stones, and a fine old Roman bridge spans the ravine on one side. The streets, as in the other towns of Barbary, are very narrow and dirty, and the houses mean. An old church in the Byzantine style is included in the citadel. C. was anciently one of the most important

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towns of Numidia, called *Carta* by the Carthaginians, *Cirta* by the Romans, and was long a royal residence. It was destroyed in the wars of Maxentius against Alexander about 311 A.D., but was soon rebuilt by Constantine the Great, from whom it derives its present name, and continued to subsist, and was a flourishing town in the 12th century. Subsequently it shared in general the fortunes of Algeria (q. v.). It was captured by the French in 1837. C. has manufactures of woolen cloths, saddlery, and other articles of leather. Pop. '91, 46,581.

CONSTANTINE I., FLAVIUS VALERIUS AURELIUS, surnamed "the Great," a Roman emperor, was b. 272 or 274 A.D., at Naissus, in Mœsia. He was the eldest son of Constantius Chlorus, and first distinguished himself by his military talents under Diocletian, in that monarch's famous Egyptian expedition, 296; subsequently he served under Galerius in the Persian war. In 305, the two emperors, Diocletian and Maximian, abdicated, and were succeeded by Constantius Chlorus and Galerius. Galerius, who could not endure the brilliant and energetic genius of C., took every means of exposing him to danger, and it is believed that this was the period when he acquired that mixture of reserve, cunning, and wisdom, which was so conspicuous in his conduct in after-years. At last C. fled to his father, who ruled in the west, and joined him at Boulogne just as he was setting out on an expedition against the Picts in North Britain. Constantius died at York, July 25, 306, having proclaimed his son C. his successor. The latter now wrote a conciliatory letter to Galerius, and requested to be acknowledged as Augustus. Galerius did not dare to quarrel with C., yet he granted him the title of Cæsar only. Political complications now increased, and in a short time no less than six emperors were "in the field"—viz., Galerius, Licinius, and Maximin in the east, and Maximian, Maxentius his son, and Constantine in the west, 308 A.D. Maxentius having quarreled with his father, forced him to flee from Rome; he took refuge with C., but was ungrateful enough to plot the destruction of his benefactor. This being discovered, he fled to Marseilles, the inhabitants of which city gave him up to C., who put him to death, 309 A.D. Maxentius professed great anger at the death of his father, and assembled a large army, with which he threatened Gaul. Crossing the Alps by Mont Cénis, C. thrice defeated Maxentius—first near Turin, then under the walls of Verona, and finally in the vicinity of Rome, 28th Oct., 312, Maxentius himself in the last of these engagements being drowned in an attempt to escape across the Tiber. C. now entered the capital, disbanded the Prætorians, and adopted other judicious measures for allaying the public exitement. He was also honored with the title of *pontifex maximus*, or supreme dignitary of the pagan hierarchy.

C. was now sole emperor of the west. Similarly, by the death of Galerius in 311, and of Maximin in 313, Licinius became sole emperor of the east. In 314, a war broke out between the two rulers, in which Licinius had the worst, and was fain to conclude a peace by the cession of Illyricum, Pannonia, and Greece. C. gave Licinius his sister Constantina in marriage, and for the next nine years devoted himself vigorously to the correction of abuses in the administration of the laws, to the strengthening of the frontiers of his empire, and to the chastising the barbarians, who learned to fear and respect his power. In 323, he renewed the war with Licinius, whom he defeated, and ultimately put to death. C. was now at the summit of his ambition, the sole governor of the Roman world. He chose Byzantium for his capital, and in 330, solemnly inaugurated it as the seat of government, under the name of Constantinople or City of Constantine. (See DONATION OF CONSTANTINE.) In 324 he committed a deed that has thrown a dark shade over his memory. He had a gallant and accomplished son, named Crispus, who was exceedingly popular, and him, along with Constantina and others, he put to death on a charge of treason. Niebuhr shows that it was not unlikely Crispus cherished ambitious designs. Next year occurred the great council of Nice. C. sided with the orthodox fathers, probably for very heterodox reasons. As yet he was a pagan, but his sense of justice, and his conviction of the growing importance of the Christians, both as a moral and political element in the life of the empire, had from the very first induced him to protect them. As early as 313, he had everywhere granted them toleration, and since then continued to favor them more and more decidedly. As president of the Nicene council, he opposed the Arians, on political grounds, as the weaker party; but not being theologically interested in the dissensions, he refrained from active persecution. During the latter years of his life, Christianity became the state religion, the pagan temples were closed, and sacrifices forbidden. Yet it was only a short time before his death, which occurred 22d July, 337, that he would allow himself to be baptized.

The question has been much discussed, whether or not C. was a Christian. The truth seems to be, that he looked upon religion as a *statesman*, who feels that his first duty is to rule the nation over which he is set in an orderly and peaceable manner. Had paganism been still in its prime, and possessed any real political vitality, it is not likely that a man of C.'s secular temperament would have troubled himself in regard to the new faith; but when he found that the latter was making rapid progress in spite of the fiercest persecution, he must have felt it wisest, and probably also conceived it *right*, to protect and favor it. But he continued to the last addicted to many pagan superstitions. As an emperor, however, he ranks very high. He was beloved by his people, for whose welfare he seems to have honestly labored. Severe and even sanguinary towards individuals, he was just and moderate towards nations. He conquered every enemy, organized a new and better mode of government for his

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vast dominions, crushed all conspiracies and revolts, and passed the close of his life in peace. See illus., ROMAN ART, vol. XII.

CONSTANTINE II., 312–40; eldest son of Constantine the Great. On the death of his father the empire was divided between the three surviving sons, but Constantine II. being the eldest was considered the emperor.

CONSTANTINE VII., PORPHYROGENITUS, 905–59; Roman emperor of the east, son of Leo VI. He paid more attention to literature than to state affairs, leaving the latter to his wife Helena. It is reported that he was poisoned by his son Romanus, who was his successor. He wrote a life of his grandfather, Basil I., a work on government, for the instruction of his son, and several other treatises.

CONSTANTINE XIII., PALÆOLOGUS, the last of the emperors of the east, b. 1394; killed at the capture of Constantinople in 1453. When Mohammed II. set about the taking of Constantinople and the final subjugation of the eastern empire, Constantine appealed in vain to the princes of Christendom. A long siege preceded the capture of the city, but it was accomplished May 29, 1453, and Constantine was slain by some unknown hand. The body was recognized and the head was brought to Mohammed, but he gave the body an honorable burial.

CONSTANTINE, DUKE OF SPARTA, heir-apparent to the throne of Greece, b. 1868, married the Princess Sophia of Prussia in 1889. He was appointed commander-in-chief of the Greek troops operating against the Turkish forces under Edhem Pasha, in Thessaly, in March, 1897, and conducted the retreat from Dhomokos in May of that year. See GREECE and TURKEY.

CONSTANTINE, NICOLAEWITCH, grand-duke of Russia, b. 21st Sept., 1827, was the second son of the late emperor Nicholas, and the brother of Alexander II. He was grand-admiral of the Russian fleet, and held besides innumerable military offices. During the Crimean war, he commanded the Russian fleet in the Baltic, and directed the defensive preparations which held the English and French armaments in check before Cronstadt. The leader of the old Russian party, he strenuously opposed the concessions made to the western powers In 1857, however, he visited the courts of England and France, and in 1871, he paid a second visit to England. On the outbreak of the Polish insurrection in 1862, C. held the office of viceroy of Poland for three months. In Jan., 1865, he was appointed president of the council of the empire. D. in 1892.

CONSTANTINE, PAULOWITCH, a Russian grand-duke, b. 8th May, 1779, was the second son of the emperor Paul I. He early distinguished himself by activity, intellectual ability, and a gallantry bordering on foolhardiness, of which he gave remarkable proof at the battle of Austerlitz. After the congress of Vienna, the government of Poland was intrusted to him by his brother, the emperor Alexander. In Jan., 1822, he executed a private deed by which he resigned his claims to the throne in the event of Alexander's death; and when that event took place in 1825, he adhered to this resignation, although he had meanwhile in his absence been proclaimed emperor in St. Petersburg. The succession thus fell to his younger brother Nicholas. The character of C.'s administration in Poland was not such as to conciliate any class of the people, and a widely ramified conspiracy was formed. The French revolution of 1830 supplied the spark which set all in flame, and C. was obliged to flee for his life, but he returned in command of the army of reserve. He died, however, of cholera at Vitebsk, on 27th June, 1831.

CONSTANTINO'PLE, called by the Turks *Stamboul* or *Istamboul*, was originally called *Byzantium* (q.v.). In 330 A.D., the emperor Constantine made it the capital of the Roman empire, and called it after his own name, Constantinople. From this period dates its importance. It continued thenceforth to be the residence of the Roman, and afterwards of the Byzantine emperors, till in 1453 it was taken by the Turks. Since that time it has been the capital of Turkey, and the principal residence of the sultans. It is situated in lat. 41° n., and long. 28° 59' e., on the European side of the channel of Constantinople or Thracian Bosporus, near to its opening into the sea of Marmora. A harrow arm of the sea, called the Golden Horn, extends about 5 m. into the land, and forms a safe and most commodious harbor, with water of sufficient depth to float the largest men of war. C. proper, to which Europeans give the name of Stamboul to distinguish it from the northern and eastern suburbs of C., lies entirely on the southern side of the Golden Horn, and is protected by a wall built during the time of the Byzantine empire, and partially restored by the Turks. The wall is about 12½ m. in circuit, and is pierced by 28 gates, amongst which that of Top-Kapussi, formerly that of St. Romanus, has a historic interest, as being the one through which the Turks entered when they stormed the city, and where the last of the Palæologi died in the fight. The suburbs of Galata, Pera, and Top-hanêh are situated on the northern side of the Golden Horn. On the Asiatic side of the Bosporus lie Scutari and Kadiköi (the ancient Chalcedon), and to the n.w. of the city lies the town of Eyub. The city itself is built on hilly ground, and from this circumstance, and its numerous gardens, cypresses, mosques, palaces, minarets, and towers, it presents, especially as seen from the side of the Golden Horn, a very spendid appearance. The scenery of the Thracian Bosporus is of almost unrivaled beauty; and the panorama, of which C. forms the principal part, is such as is perhaps nowhere else to be seen in the world. But a nearer approach reveals the characteristics of an eastern town—narrow, crooked, filthy streets, and miserable houses of wood and clay. Since the Crimean war, however, C. has been wonderfully improved. Great

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fires, which occurred on the 6th and 7th Sept., 1865, the 3d May, 1866, and on 5th June, 1870, swept away square miles of old wooden houses on both sides of the Golden Horn. On these spaces handsome stone houses have been built in the modern European style; but this has not been done with much system, and there are in all directions great gaps filled with miserable wooden huts, or left as waste places. The formation of tramways has, however, tended to connect the improved districts by wider thoroughfares, and to form a general plan which is gradually giving to C. the appearance of a European city. C. contains many fine buildings, among which may be mentioned the Seraglio, occupying the position of ancient Byzantium, and measuring about 3 m. in circumference; the former church of St. Sophia, now a mosque, is a most magnificent structure, in the form of a Greek cross, 269 ft. long by 243 broad, and has a flattened dome, greatly admired for its lightness, 180 ft. above the ground. The other important mosques are those of Solyman, Achmed, Sultan Mohammed II. and Eyub. The two obelisks of the ancient hippodrome, called by the Turks the *Atmeidan;* the castle of the seven towers, now in a state of dilapidation; the aqueducts erected by the emperor Valens; the cistern of Philoxenus, with 424 columns of marble; and the numerous fountains, are among the other most notable objects of Constantinople. The covered bazaars of C. are very numerous, and the goods are displayed with wonderful attractiveness. One feature of C. is its vast number of lean and hungry dogs, which haunt the streets. The dogs are the common property of the city, and they do a considerable portion of the scavenging. Galata, which was founded by the Genoese as a republic in the Byzantine times, is the residence of European merchants and the principal place of trade. It contains many great warehouses, shops, and dwelling-houses, but is, if possible, even more filthy than C. proper. Bridges of boats connect the opposite sides of the Golden Horn. Further eastward, on the Bosporus, lies Top-hanêh, with the imperial cannon foundry, a beautiful mosque, and an interesting fountain. On the hill behind Galata and Top-hanêh, is situated Pera, the residence of the foreign ambassadors. Two thirds of Pera were burned to the ground by the fire of 5th June, 1870. Three thousand houses were then entirely destroyed, including that of the English ambassador; and 40,000 persons were left without shelter. Before the fire, Pera had a European pop. of 70,000, which was reduced by the catastrophe to more than one half. Pera is not being rebuilt on its old site, but new streets are spreading round it and Galata. In 1875, Pera was connected with C. by an underground railway. General attention was drawn to the city by the events of 1895–97 in connection with the Armenian and Cretan questions and the war with Greece. In 1896 occurred the seizure of the Ottoman bank by a small body of Armenians, and there followed a massacre by the Turkish mob, and a wholesale deportation of the Armenians by order of the porte.

The census returns for the Turkish empire are very defective. In 1885 the pop. numbered 873,565. In 1890, C. probably contained from 800,000 to 975,000 inhabitants, of whom about one-half were Mohammedans, one-fourth Greeks and Armenians, one-eighth Franks, and one-eighth Jews. The mosques are 380 in number. There are several Greek churches, under a patriarch, with twelve synodal bishops. The patriarch is not only the spiritual, but in part also the temporal head of the Greek subjects of the porte. C. is the residence also of an Armenian patriarch, and there are several Roman Catholic and Protestant places of worship. Besides the university established in 1847, there are government military, naval, and medical colleges, and many inferior schools. Near by on a picturesque site on the Bosporus is Robert College (opened in 1863), in which the English language is employed in instruction. Among the benevolent institutions are numerous *imarets*, where food is provided for the poor, and hospitals for the sick of several European nations. There are public libraries, both Turkish and Greek, of which that of the Seraglio is particularly rich in the treasures of oriental literature; and there are several Turkish and European printing-presses. The public baths and coffee-houses are exceedingly numerous. Some of the peculiar manufactures of the east are carried on in leather, carpets, weapons, etc. But all the manufactures of western Europe abound in its markets. The trade of C. has, since the Crimean war, been steadily increasing, but is by no means so extensive as might be expected from its population and situation. The trade is chiefly in the hands of Greeks, Italians, Austrians, British, French, and Germans.

The great strategical value of the site of C. has always lent it a peculiar military and political importance. Extensive fortifications at some distance on the landward side of C. were undertaken during the Russian war of 1877, and were carried out under the superintendence of an English officer in the Turkish service. These lines extend from Buyuk-Tchekmedgi on the sea of Marmora to lake Derkos on the Black sea, a distance of about 20 miles. They run along a range of steep hills, from 200 to 500 ft. in height, looking down on a long and wide bare valley. Eight miles distant across the valley runs the parallel range of the Tchataldja hills, from 500 to 1500 ft. high.

C. is now connected by railway with the interior of northern Turkey, and the northwestern part of Asia Minor. The first through express train from western Europe, inaugurating a direct service with Paris, reached Stamboul station on Nov. 10, 1888. Salonica and Uskub in western Turkey, also, are connected, and there is another line from Smyrna to Aidin. See Grosvenor, *Constantinople*, 2 vols. (1896); and illus., **Turkey**, vol. XIV.

Constantinople, Councils of. Eight have been held which are recognized as ecumenical either by the Greek or Latin church, or by both. The *first* was the 2d

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ecumenical council of the church, convened in 381 by the emperor Theodosius I. to legalize his violent ejectment of the Arians from the eastern churches. It consisted of 150 bishops, chosen under the dictation of the emperor and chiefly from the east, besides the semi-Arians, followers of Macedonius of Constantinople, who withdrew after their opinions had been condemned. This council condemned also the Arians, Eunomians, and Eudoxians; it reaffirmed the resolutions of the council of Nice, and declared that the bishop of Constantinople, or new Rome, was, of right, next in rank to the bishop of old Rome; both of them being alike subject only to the emperor. The *second* was the 5th ecumenical council of the church, convened in 553 by Justinian I. to sustain his condemnation of three distinguished teachers of the Antiochian school whose opinions had been collected into "three chapters." There were 165 bishops, mostly eastern, in attendance. They condemned the "three chapters" and included in the sentence Vigilius, bishop of Rome, because he would not condemn them absolutely. The *third* was the 6th ecumenical council, held in 680, and consisting of 289 bishops, including three eastern patriarchs and four Roman legates. Through the influence of the legates, the council condemned the doctrine of Honorius that "as there was only one Christ, so he had only one will," and recognized in him, consistently with the doctrine of two natures in one person, two wills made one by the moral subordination of the human to the divine. The *fourth* was the council held in 691, by command of Justinian II. It is recognized as ecumenical only by the Greeks, and is called "*quinisextum*" because it supplemented the 5th and 6th. It passed more than one hundred canons concerning the morals of the clergy and church discipline. The *fifth* was held in 754 and attended by 383 bishops. It is recognized only by the Greeks. It issued a decree against image worship, which was revoked in 786 by the 2d ecumenical council of Nice. The *sixth* was held in 869, and is recognized only by the Latin church. It deposed the patriarch Photius, restored Ignatius, and enacted laws concerning church discipline. The *seventh* was held in 879. There were 380 bishops present, including the Roman legates. It recalled Photius, repealed the action of the preceding council against him, and defined the position of the patriarch of Constantinople in relation to the pope. The *eighth* was held in 1341, and is called by the Greeks the 9th ecumenical. It condemned Barlaam, an educated monk, as heretical in opposing the monks of mount Athos, who asserted the possibility of attaining, while yet in the body, an intuition of the divine light and essence by a perfect cessation of corporeal life.

CONSTAN'TIUS, OR CONSTANTIUS CHLORUS, FLAVIUS VALERIUS, 250–306 A.D.; Emperor of Rome and father of Constantine the Great. He became emperor in 305, when Diocletian abdicated, and ruled over Gaul, Spain, and Britain.

CONSTAN'TIUS, FLAVIUS JULIUS, b. 317 A.D. He inherited by his father's will the Asiatic provinces and Egypt. He made war upon the Persians, but was defeated. He was favorable to the Arians, and gave the title of cæsar (emperor) to his cousin and successor Julian, against whom he afterwards declared war, but died before fighting a battle, 361 A. D.

CONSTELLA'TION (Lat. *con*, together, and *stella*, a star), a group of stars. The stars which stud the firmament have, from a time earlier than authentic records can trace, been formed into artificial groups, which have received names borrowed from fancy or fable. These groups are called constellations. Though quite devoid of anything like systematic arrangement, this traditional grouping is found a sufficiently convenient classification, and still remains the basis of nomenclature for the stars among astronomers. Before the invention of almanacs, the risings and settings of the constellations were looked to by husbandmen, shepherds, and sea-faring men as the great landmarks of the seasons, and consequently of the weather which each season was expected to bring with it (see Job xxxviii. 31); and it is not surprising if the storms or calm weather that usually accompanied such seasons were connected, in the popular imagination, with the influence of the stars themselves, or the beings with whom superstition or fable identified them. Thus, the risings and settings of Bootes with the bright star Arcturus, which took place near the equinoxes, portended great tempests. See Virgil's *Georgics*, i. 204. The great heat in July was ascribed to the rising of Canis the dog, with its bright star Sirius. See CANICULAR DAYS; and HELIACAL RISING. The appearance of the twins, Castor and Pollux, was hailed as the harbinger of fair summer weather.

Almost all nations have, from early times, arranged the stars into constellations, but it is chiefly from the nomenclature of the Greeks and Romans that our own is derived. Eudoxus, a contemporary of Plato, about 370 years B.C., gave a description of the face of the heavens, containing the names and characters of all the constellations recognized in his time. Though this production is lost, a poetical paraphrase of it, written about a century later by Aratus (q.v.), is still extant. This poem describes twelve zodiacal constellations (see ZODIAC), with twenty in the northern hemisphere, and thirteen in the southern. The next enumeration occurs in the *Almagest* of Ptolemy, which includes the preceding, with three additional, one northern and two southern constellations, making in all 48. These are the ancient stellar groups. Large accessions have been made to the nomenclature in modern times, in consequence of maritime discovery having made us acquainted with constellations in the southern hemisphere which never rose upon the world known to our ancient authors. In 1751, Lacaille went to the Cape for the purpose of making a catalogue of the southern stars, and forming them into constel-

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lations—an undertaking which he prosecuted with great ardor for nearly four years at the expense of the French government. Flattery has also contributed towards the stellar nomenclature. Upon the restoration of Charles II., the evening before his return to London, sir Charles Scarborough, the court physician, was gazing upon a star in the northern heavens, which shone with greater luminosity than usual, as might be expected from a loyal star on such an occasion. This, in connection with a few others, was formed into Cor Caroli, the heart of Charles II., by Halley, at the doctor's recommendation. The chief constellations will be noticed under their several names. See ARIES, URSA MAJOR, etc. The fanciful figures from which the constellations are named, are depicted on celestial globes and maps of the heavens. In the older writers, C. signifies the relative positions of the planets at a given moment. See ASPECT.

CONSTIPA'TION, a state of the system marked by an irregular and sluggish action of the bowels upon their contents, due either to defective secretion of the juices of the intestinal mucous membrane, or to an imperfection of the peristaltic movements (see DIGESTION). Sedentary habits predispose to C., as also does the use of animal food in too great a relative amount. The use of brown bread, or of lentils, oatmeal porridge, of green vegetables and salads, or of ripe fruits; the plentiful employment of salt or of saline drinks, or of many natural mineral waters; and active exercise, especially by walking or riding on horseback in the open air, tend to avert this disease. A favorite remedy with some is the use of a cloth wrung out of cold water, and applied to the abdomen; this, as used at hydropathic establishments, is called an "abdominal compress," and is worn under a bandage of macintosh cloth, to keep the moisture from escaping, during the earlier part of the day. But to many persons affected with C., and unable from circumstances to follow out the plan of life here indicated, and to many others in whom the disease does not yield to these means, the use of laxatives, or mild cathartics (q.v.), is almost a necessity; and it is satisfactory to know that these remedies, if judiciously selected, and not employed so as to produce over-action, may be taken during very many years without any of the bad effects often ascribed to them.

Constipation in the lower animals depends, as in man, on imperfect secretion from, or motion of, the intestinal walls. In the horse, it is usually accompanied by colic (q.v.), and when long continued, leads to enteritis (q.v.). The appropriate remedies are soap and water clysters, given every two hours; smart friction and cloths wrung out of hot water applied to the abdomen, with three drachms of aloes, and one of calomel, given in gruel, and repeated in sixteen hours, if no effect is produced. Give, besides, walking exercise; restrict the amount of dry solid food, but allow plenty of thin gruel or other fluids, which may be rendered more laxative by admixture with treacle or a little salt. Similar treatment is called for in dogs, cats, and pigs. In cattle and sheep, digestion principally takes place in the large and quadrisected stomach; the bowels, accordingly, are little liable to derangement; and C., when occurring in these animals, generally depends upon impaction of dry hard food between the leaves of the maniples, third stomach, or fardel-bag. The complaint is hence called *fardel-bound.* It results from the eating of tough and indigestible food, such as ripe vetches, rye-grass, or clover; it prevails in dry seasons, and on pastures where the herbage is coarse and the water scarce. It occurs amongst cattle partaking freely of hedge-cuttings or shoots of trees, hence its synonym of *wood-evil.* From continuous cramming and want of exercise, it is frequent in stall-feeding animals; whilst from the drying up of the natural secretions, it accompanies most febrile and inflammatory diseases. The milder cases constitute the ordinary form of indigestion in ruminants, are accompanied by what the cow-man terms *loss of cud,* and usually yield to a dose of salts given with an ounce or two of ginger. In more protracted cases, rumination is suspended, appetite gone, constipation and fever are present. There is a grunt noticeable, especially when the animal is moved, and different from that accompanying chest-complaints, by its occurrence at the commencement of *ex*piration. By pressing the closed fist upwards and forwards beneath the short ribs on the right side, the round, hard, distended stomach may be felt. This state of matters may continue for ten days or a fortnight, when the animal, if unrelieved, becomes nauseated, and sinks. Stupor sometimes precedes death, whilst in some seasons and localities most of the bad cases are accompanied by excitement and frenzy. In this, as in other respects, the disease closely corresponds with stomach-staggers in the horse.

Treatment.—Give purgatives in large doses, combining several together, and exhibiting them with stimulants in plenty of fluid. For a medium-sized ox or cow, use ½ lb. each of common and Epsom salts, ten croton beans, and a drachm of calomel, with 3 ozs. of turpentine; and administer this in half a gallon of water. If no effect is produced in twenty hours, repeat the dose. Withhold all solid food; encourage the animal to drink gruel, sloppy mashes, treacle and water; and give exercise, clysters, and occasional hot fomentations to the belly.

CONSTITUENT ASSEMBLY. See ASSEMBLY, NATIONAL.

CONSTITUTION, in politics (*constitutio,* from Lat. *constituere,* to set up, or establish). In its modern acceptation, C. signifies a system of law established by the sovereign power of a state *for its own guidance.* Such being the ultimate object of a C., its proximate objects, generally stated, are, to fix the limits and define the relations of the

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legislative, the judicial, and the executive powers of the state, both amongst themselves and with reference to the citizens of the state, regarded as a governed body. Among the Romans, a C. was at first nearly synonymous with the edict of a prætor (see EDICT), and even under the empire signified only an imperial edict or decree. In continental countries, since the formation of the federal government of the United States of America, or, at all events, since the first French revolution, the idea of a C. has been generally that of a body of written public law, promulgated at once by the sovereign power. See CODE and ASSEMBLY, NATIONAL. In Great Britain it is the whole body of the public law, consuetudinary as well as statutory, which has grown up during the course of ages, and is continually being modified by the action of the general will as interpreted and expressed by the parliamentary representatives of the nation. Much confusion is often introduced into our conceptions of the action of the English and other mixed governments by representing the three elements of which they are generally composed—the monarchical, aristocratic, and democratic (king, lords, and commons)—as the centers of three independent sovereignties, whereas they are only three organs through which the one sovereignty finds expression. There is, and can be, in an independent state, but one sovereignty—one center of power—viz., the general will of the nation. Opposition to this will, from whencesover it may come, within the state, is treason in the individual, and rebellion in the mass; whereas the vindication of this will by its own act may be revolution, but can never be rebellion. Another source of error consists in supposing this general will to be the numerical aggregate of all the individual wills in the community. It is, on the contrary, the sum of all the wills, not numerically but really, making allowance, that is to say, for the fact that one individual, from the greater clearness of his convictions and strength of his character, often contributes to this sum, or mass of volition, ten times as much as another individual.

But though the idea of a mixed government is generally associated with that of a C., it does not seem to be inseparable from it. We are not entitled, for example, to deny the name of a C. to a system which is apparently the result of one single will, if to that will the general will has freely confided the task of determining the rules by which it shall be governed. Assuming that the late emperor of the French was invested with supreme power by this ultimate sovereign, the general will, the government which he established was, for the time being, the C. of France. But inasmuch as France had, under the imperial system of government, no parliamentary machinery for effecting desired or desirable changes in its C., the "right of revolution," as it is called, became a necessity on the part of those who conceived that they embodied and were in a condition to express the general will. Disorderly as it may seem to us, it was really within the limits of the C., as constitutional as the C. which at any moment it might have overthrown. In a parliamentary government like that of England, however, the right of revolution emerges only when the self-modifying powers of the C. are obstructed or opposed by the executive, as took place in 1688. Whilst in pure monarchies it hangs permanently over the head of the executive, even when acting in accordance with the C., in a free country resistance is rebellion in all cases in which the machinery which the C. possesses for its own modification is unimpeded in its action. Of resistance of this latter kind, the events that culminated in the late American civil war furnish an example.

For a historical account of the English C., see ENGLAND; see also PARLIAMENT, CONGRESS, CODE, CORTES, etc. See Gneist's *History of the British Constitution;* De Lolme on the British constitution; and Hallam's *The British Constitution.*

The C. is the written organic law under which the national government, and the several state governments, in the United States are carried on. The Constitution of the United States is as follows:

We, the people of the United States, in order to form a more perfect union, establish justice, insure domestic tranquillity, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this constitution for the United States of America.

ARTICLE I., Sec. 1. All legislative powers herein granted shall be vested in a congress of the United States, which shall consist of a senate and house of representatives.

Sec. 2. The house of representatives shall be composed of members chosen every second year by the people of the several states, and the electors in each state shall have the qualifications requisite for electors of the most numerous branch of the state legislature.

No person shall be a representative who shall not have attained to the age of twenty-five years, and been seven years a citizen of the United States, and who shall not, when elected, be an inhabitant of that state in which he shall be chosen.

Representatives and direct taxes shall be apportioned among the several states which may be included within this union according to their respective numbers, which shall be determined by adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, three fifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct. The number of representatives shall not exceed one for every thirty thousand, but each state shall have at least one representa-

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tive; and until such enumeration shall be made, the state of New Hampshire shall be entitled to choose 3; Massachusetts, 8; Rhode Island and Providence Plantations, 1; Connecticut, 5; New York, 6; New Jersey, 4; Pennsylvania, 8; Delaware, 1; Maryland 6; Virginia, 10; North Carolina, 5; South Carolina, 5; and Georgia, 3.

When vacancies happen in the representation from any state, the executive authority thereof shall issue writs of election to fill such vacancies.

The house of representatives shall choose their speaker and other officers; and shall have the sole power of impeachment.

Sec. 3. The senate of the United States shall be composed of two senators from each state, chosen by the legislature thereof, for six years; and each senator shall have one vote.

Immediately after they shall be assembled in consequence of the first election, they shall be divided as equally as may be into three classes. The seats of the senators of the first class shall be vacated at the expiration of the second year, of the second class at the expiration of the fourth year, and of the third class at the expiration of the sixth year, so that one third may be chosen every second year; and if vacancies happen by resignation, or otherwise, during the recess of the legislature of any state, the executive thereof may make temporary appointments until the next meeting of the legislature, which shall then fill such vacancies.

No person shall be a senator who shall not have attained to the age of thirty years, and been nine years a citizen of the United States, and who shall not, when elected, be an inhabitant of that state for which he shall be chosen.

The vice-president of the United States shall be president of the senate, but shall have no vote, unless they be equally divided.

The senate shall choose their other officers, and also a president *pro tempore*, in the absence of the vice-president, or when he shall exercise the office of president of the United States.

The senate shall have the sole power to try all impeachments; when sitting for that purpose, they shall be on oath or affirmation. When the president of the United States is tried, the chief-justice shall preside; and no person shall be convicted without the concurrence of two thirds of the members present.

Judgment in cases of impeachment shall not extend further than to removal from office, and disqualification to hold and enjoy any office of honor, trust, or profit under the United States; but the party convicted shall nevertheless be liable and subject to indictment, trial, judgment, and punishment, according to law.

Sec. 4. The times, places, and manner of holding elections for senators and representatives shall be prescribed in each state by the legislature thereof; but the congress may at any time, by law, make or alter such regulations, except as to the places of choosing senators.

The congress shall assemble at least once in every year, and such meeting shall be on the first Monday in Dec., unless they shall, by law, appoint a different day.

Sec. 5. Each house shall be the judge of the elections, returns, and qualifications of its own members, and a majority of each shall constitute a quorum to do business; but a smaller number may adjourn from day to day, and may be authorized to compel the attendance of absent members, in such manner and under such penalties as each house may provide.

Each house may determine the rules of its proceedings, punish its members for disorderly behavior, and, with the concurrence of two thirds, expel a member.

Each house shall keep a journal of its proceedings, and from time to time publish the same, excepting such parts as may in their judgment require secrecy, and the yeas and nays of the members of either house on any question shall, at the desire of one fifth of those present, be entered on the journal.

Neither house, during the session of congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two houses shall be sitting.

Sec. 6. The senators and representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the treasury of the United States. They shall in all cases, except treason, felony, and breach of the peace, be privileged from arrest during their attendance at the session of their respective houses, and in going to and returning from the same; and for any speech or debate in either house they shall not be questioned in any other place.

No senator or representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States, which shall have been created, or the emoluments whereof shall have been increased during such time; and no person holding any office under the United States shall be a member of either house during his continuance in office.

Sec. 7. All bills for raising revenue shall originate in the house of representatives; but the senate may propose or concur with amendments, as on other bills.

Every bill which shall have passed the house of representatives and the senate, shall, before it become a law, be presented to the president of the United States; if he approve, he shall sign it; but if not, he shall return it, with his objections, to that house in which it shall have originated, who shall enter the objections at large on their jour-

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nal, and proceed to reconsider it. If after such reconsideration two thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered; and if approved by two thirds of that house, it shall become a law. But in all such cases, the votes of both houses shall be determined by yeas and nays, and the names of the persons voting for and against the bill shall be entered on the journal of each house respectively. If any bill shall not be returned by the president within ten days (Sunday excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the congress by their adjournment prevent its return; in which case it shall not be a law.

Every order, resolution, or vote to which the concurrence of the senate and the house of representatives may be necessary (except on a question of adjournment) shall be presented to the president of the United States; and before the same shall take effect, shall be approved by him, or, being disapproved by him, shall be repassed by two thirds of the senate and house of representatives, according to the rules and limitations prescribed in the case of a bill.

Sec. 8. The congress shall have power to lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defense and general welfare of the United States; but all duties, imposts, and excises shall be uniform throughout the United States;

To borrow money on the credit of the United States;

To regulate commerce with foreign nations, and among the several states, and with the Indian tribes;

To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States;

To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures;

To provide for the punishment of counterfeiting the securities and current coin of the United States;

To establish post-offices and post-roads;

To promote the progress of science and useful arts, by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries;

To constitute tribunals inferior to the supreme court;

To define and punish piracies and felonies committed on the high seas, and offenses against the law of nations;

To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water;

To raise and support armies, but no appropriation of money to that use shall be for a longer term than two years;

To provide and maintain a navy;

To make rules for the government and regulation of the land and naval forces;

To provide for calling forth the militia to execute the laws of the union, suppress insurrections, and repel invasions;

To provide for organizing, arming, and disciplining the militia, and for governing such part of them as may be employed in the service of the United States, reserving to the states respectively the appointment of the officers, and the authority of training the militia according to the discipline prescribed by congress;

To exercise exclusive legislation in all cases whatsoever over such district (not exceeding ten miles square) as may, by cession of particular states, and the acceptance of congress, become the seat of the government of the United States, and to exercise like authority over all places purchased by the consent of the legislature of the state in which the same shall be, for the erection of forts, magazines, arsenals, dock-yards, and other needful buildings; and

To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this constitution in the government of the United States, or in any department or officer thereof.

Sec. 9. The migration or importation of such persons as any of the states now existing shall think proper to admit shall not be prohibited by the congress prior to the year one thousand eight hundred and eight; but a tax or duty may be imposed on such importation, not exceeding ten dollars for each person.

The privilege of the writ of *habeas corpus* shall not be suspended, unless when in cases of rebellion or invasion the public safety may require it.

No bill of attainder or *ex post facto* law shall be passed.

No capitation or other direct tax shall be laid, unless in proportion to the census or enumeration hereinbefore directed to be taken.

No tax or duty shall be laid on articles exported from any state.

No preference shall be given by any regulation of commerce or revenue to the ports of one state over those of another; nor shall vessels bound to or from one state be obliged to enter, clear, or pay duties in another.

No money shall be drawn from the treasury but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

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No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them shall, without the consent of the congress, accept of any present, emolument, office, or title, of any kind whatever, from any king, prince, or foreign state.

Sec. 10. No state shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make anything but gold and silver coin a tender in payment of debts; pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts, or grant any title of nobility.

No state shall, without the consent of the congress, lay any impost or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts, laid by any state on imports or exports, shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and control of the congress.

No state shall, without the consent of congress, lay any duty of tonnage, keep troops, or ships of war in time of peace, enter into any agreement or compact with another state, or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay.

ARTICLE II., Sec. 1. The executive power shall be vested in a President of the United States of America. He shall hold his office during the term of four years, and, together with the vice-president, chosen for the same term, be elected as follows:

Each state shall appoint, in such manner as the legislature thereof may direct, a number of electors, equal to the whole number of senators and representatives to which the state may be entitled in the congress; but no senator or representative, or persons holding an office of trust or profit under the United States, shall be appointed an elector.*

The congress may determine the time of choosing the electors, and the day on which they shall give their votes; which day shall be the same throughout the United States.

No person, except a natural-born citizen, or a citizen of the United States at the time of the adoption of this constitution, shall be eligible to the office of president; neither shall any person be eligible to that office who shall not have attained to the age of 35 years, and been 14 years resident within the United States.

In case of the removal of the president from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the vice-president, and the congress may by law provide for the case of removal, death, resignation, or inability, both of the president and vice-president, declaring what officer shall then act as president, and such officer shall act accordingly, until the disability be removed, or a president shall be elected.

The president shall, at stated times, receive for his services a compensation, which shall neither be increased nor diminished during the period for which he shall have been elected, and he shall not receive within that period any other emolument from the United States, or any of them.

Before he enter on the execution of his office, he shall take the following oath or affirmation: "I do solemnly swear (or affirm) that I will faithfully execute the office of president of the United States, and will, to the best of my ability, preserve, protect, and defend the constitution of the United States."

Sec. 2. The president shall be commander-in-chief of the army and navy of the United States, and of the militia of the several states, when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive departments upon any subject relating to the duties of their respective offices, and he shall have power to grant reprieves and pardons for offenses against the United States, except in cases of impeachment.

He shall have power, by and with the advice and consent of the senate, to make treaties, provided two thirds of the senators present concur; and he shall nominate, and by and with the advice and consent of the senate, shall appoint ambassadors, other public ministers and consuls, judges of the supreme court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law; but the congress may by law vest the appointment of such inferior officers as they think proper in the president alone, in the courts of law, or in the heads of departments.

The president shall have power to fill up all vacancies that may happen during the recess of the senate, by granting commissions which shall expire at the end of their next session.

Sec. 3. He shall from time to time give to the congress information of the state of the union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may on extraordinary occasions convene both houses, or either of them, and in case of disagreement between them, with respect to the time of adjournment, he may adjourn them to such time as he shall think proper; he shall receive ambassadors and other public ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States.

* This mode of election of president and vice-president has been modified by the twelfth amendment, *post*.

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Sec. 4. The president, vice-president, and all civil officers of the United States, shall be removed from office on impeachment for, and conviction of, treason, bribery, or other high crimes and misdemeanors.

ARTICLE III., Sec. 1. The judicial power of the United States shall be vested in one supreme court, and in such inferior courts as the congress may from time to time ordain and establish. The judges, both of the supreme and inferior courts, shall hold their offices during good behavior, and shall, at stated times, receive for their services a compensation, which shall not be diminished during their continuance in office.

Sec. 2. The judicial power shall extend to all cases, in law and equity, arising under this constitution, the laws of the United States, and treaties made, or which shall be made, under their authority; to all cases affecting ambassadors, other public ministers, and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more states; between a state and citizens of another state; between citizens of different states; between citizens of the same state claiming lands under grants of different states, and between a state, or the citizens thereof, and foreign states, citizens, or subjects.

In all cases affecting ambassadors, other public ministers, and consuls, and those in which a state shall be party, the supreme court shall have original jurisdiction. In all the other cases before mentioned, the supreme court shall have appellate jurisdiction, both as to law and fact, with such exceptions and under such regulations as the congress shall make.

The trial of all crimes, except in cases of impeachment, shall be by jury; and such trial shall be held in the state where the said crimes shall have been committed; but when not committed within any state, the trial shall be at such place or places as the congress may by law have directed.

Sec. 3. Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort.

No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court.

The congress shall have power to declare the punishment of treason; but no attainder of treason shall work corruption of blood, or forfeiture except during the life of the person attainted.

ARTICLE IV., SEC. 1. Full faith and credit shall be given in each state to the public acts, records, and judicial proceedings of every other state. And the congress may by general laws prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof.

SEC. 2. The citizens of each state shall be entitled to all privileges and immunities of citizens in the several states.

A person charged in any state with treason, felony, or other crime, who shall flee from justice, and be found in another state, shall, on demand of the executive authority of the state from which he fled, be delivered up, to be removed to the state having jurisdiction of the crime.

No person held to service or labor in one state, under the laws thereof, escaping into another, shall, in consequence of any law or regulation therein, be discharged from such service or labor, but shall be delivered up on claim of the party to whom such service or labor may be due.

SEC. 3. New states may be admitted by the congress into this union; but no new state shall be formed or erected within the jurisdiction of any other state; nor any state be formed by the junction of two or more states, or parts of states, without the consent of the legislatures of the states concerned as well as of the congress.

The congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this constitution shall be so construed as to prejudice any claims of the United States, or of any particular state.

Sec. 4. The United States shall guarantee to every state in this union a republican form of government, and shall protect each of them against invasion, and, on application of the legislature, or of the executive (when the legislature cannot be convened), against domestic violence.

ARTICLE V. The congress, whenever two thirds of both houses shall deem it necessary, shall propose amendments to this constitution, or, on the application of the legislatures of two thirds of the several states, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes as part of this constitution, when ratified by the legislatures of three fourths of the several states, or by conventions in three fourths thereof, as the one or the other mode of ratification may be proposed by the congress; provided, that no amendment which may be made prior to the year one thousand eight hundred and eight shall in any manner affect the first and fourth clauses in the ninth section of the first article; and that no state, without its consent, shall be deprived of its equal suffrage in the senate.

ARTICLE VI. All debts contracted and engagements entered into before the adoption of this constitution shall be as valid against the United States under this constitution, as under the confederation.

This constitution and the laws of the United States which shall be made in pursuance

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thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the constitution or laws of any state to the contrary notwithstanding.

The senators and representatives before mentioned, and the members of the several state legislatures, and all executive and judicial officers, both of the United States and of the several states, shall be bound by oath or affirmation to support this constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

ARTICLE VII. The ratification of the conventions of nine states shall be sufficient for the establishment of this constitution between the states so ratifying the same.

Done in convention, by the unanimous consent of the states present, the 17th day of Sept., in the year of our Lord one thousand seven hundred and eighty-seven, and of the independence of the United States of America the twelfth.

AMENDMENTS.*

ARTICLE I. Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press, or the right of the people peaceably to assemble, and to petition the government for redress of grievances.

ARTICLE II. A well-regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed.

ARTICLE III. No soldier shall, in time of peace, be quartered in any house without the consent of the owner, nor in time of war but in a manner to be prescribed by law.

ARTICLE IV. The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated; and no warrants shall issue but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

ARTICLE V. No person shall be held to answer for a capital or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service, in time of war and public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb, nor shall be compelled in any criminal case to be a witness against himself; nor to be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.

ARTICLE VI. In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the state and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.

ARTICLE VII. In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury shall be otherwise re-examined in any court of the United States than according to the rules of the common law.

ARTICLE VIII. Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishment inflicted.

ARTICLE IX. The enumeration in the constitution of certain rights shall not be construed to deny or disparage others retained by the people.

ARTICLE X. The powers not delegated to the United States by the constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people.

ARTICLE XI. The judicial power of the United States shall not be construed to extend to any suit in law or equity commenced or prosecuted against one of the United States by citizens of another state, or by citizens or subjects of any foreign state.

ARTICLE XII. The electors shall meet in their respective states, and vote by ballot for president and vice-president, one of whom at least shall not be an inhabitant of the same state with themselves. They shall name in their ballots the person voted for as president, and in distinct ballots the person voted for as vice-president; and they shall make distinct lists of all persons voted for as president, and of all persons voted for as vice-president, and of the number of votes for each, which lists they shall sign and certify, and transmit, sealed, to the seat of the government of the United States, directed to the president of the senate. The president of the senate shall, in the presence of the senate and house of representatives, open all the certificates, and the votes shall then be counted; the person having the greatest number of votes for president shall be the president, if such number be a majority of the whole number of electors appointed; and if no person have such majority, then from the persons having the highest numbers, not exceeding three, on the list of those voted for as president, the house of representatives shall choose immediately, by ballot, the president. But in choosing the president, the votes shall be taken by states, the representation from each state having one vote; a quorum for this purpose shall consist of a member or members from two

* Articles I. to X., inclusive, were proposed by the first congress in 1789-90, Article XI. in 1798, Article XII. in 1803, Article XIII. in 1865, Article XIV. in 1868, and Article XV. in 1870.

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thirds of the states, and a majority of all the states shall be necessary to a choice. And if the house of representatives shall not choose a president, whenever the right of choice shall devolve upon them, before the fourth day of March next following, then the vice-president shall act as president, as in the case of the death or other constitutional disability of the president. The person having the greatest number of votes as vice-president shall be the vice-president, if such number be a majority of the whole number of electors appointed; and if no person have a majority, then from the two highest numbers on the list the senate shall choose the vice-president; a quorum for the purpose shall consist of two thirds of the whole number of senators, and a majority of the whole number shall be necessary to a choice. But no person constitutionally ineligible to the office of president shall be eligible to that of vice-president of the United States.

ARTICLE XIII., Sec. 1. Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction.

Sec. 2. Congress shall have power to enforce this article by appropriate legislation.

ARTICLE XIV., Sec. 1. All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States, and of the state wherein they reside. No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any state deprive any person of life, liberty, or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

Sec. 2. Representatives shall be apportioned among the several states according to their respective numbers, counting the whole number of persons in each state, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for president and vice-president of the United States, representatives in congress, the executive and judicial officers of a state, or the members of the legislature thereof, is denied to any of the male inhabitants of such state being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such state.

Sec. 3. No person shall be a senator or representative in congress, or elector of president and vice-president, or hold any office, civil or military, under the United States, or under any state, who, having previously taken an oath as a member of congress, or as an officer of the United States, or as a member of any state legislature, or as an executive or judicial officer of any state, to support the constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid or comfort to the enemies thereof. But congress may, by a vote of two thirds of each house, remove such disability.

Sec. 4. The validity of the public debt of the United States authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any state shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations, and claims shall be held illegal and void.

Sec. 5. The congress shall have power to enforce, by appropriate legislation, the provisions of this article.

ARTICLE XV., Sec. 1. The right of the citizens of the United States to vote shall not be denied or abridged by the United States, or by any state, on account of race, color, or previous condition of servitude.

Sec. 2. The congress shall have power to enforce this article by appropriate legislation.

The state constitutions are very much alike in their general provisions. Of late years, and especially since the rebellion, many of the states have amended and modernized their constitutions; but in all cases the state constitution must agree with the federal constitution; any provision conflicting with that is void. In 1879, California adopted certain legal restrictions tending to a discrimination against the Chinese residents of the state. These were subsequently held to conflict with the treaty between the United States and China, and as therefore void, inasmuch as the United States Constitution provides that "all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land." See Davis's *American Constitutions*, Johns Hopkins university studies, vol. iii. (Baltimore, 1885); Von Holst's *The Constitutional and Political History of the United States*. See EMIGRATION AND IMMIGRATION.

CONSTITUTIONAL CONVENTION, a gathering of delegates chosen by the people of a state to prepare amendments to an existing or propose a new constitution. The constitutional convention by which the constitution of the United States was prepared was made up of delegates from the several states, and met in Philadelphia in May, 1787, choosing George Washington as their presiding officer. Article V. of the constitution provides that amendments shall be proposed in congress, or, on the application of the legislatures of two-thirds of the several states, congress shall call a convention for proposing amendments. Such amendments must be ratified by the legislatures or constitutional conventions in three-fourths of the states. In the states, delegates to consti-

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tutional convention are usually elected by the people. Their work is submitted to the legislature, and (in most states) by the legislature to a direct vote of the people. Among the first of the original states to organize under a constitution was New York, whose first constitutional convention was held in the spring of 1777. Rhode Island was the last of the original states to adopt a constitution, which was in 1842. Up to that year she was ruled under the royal charter of 1662. The proceedings of a constitutional convention are usually governed by the rules of state legislative bodies.

CONSTITUTION OF MATTER. The ATOMIC constitution of bodies is discussed when we consider whether they consist of finite ultimate particles called *atoms*, or are infinitely divisible. The CHEMICAL constitution of bodies is the mode in which elementary substances unite to form compounds. The PHYSICAL constitution of bodies is the mode in which particles of matter in forms cognizable by sense, are aggregated to form masses of known qualities. Bodies are classed according to their ability to retain their dimensions when they are subjected to internal stress. A *solid* retains its dimensions even under the influence of a stress which acts in but a single direction. A *fluid* changes its dimensions unless the stress acting within it is uniform in all directions. If the fluid is capable of expanding indefinitely to fill the vessel which contains it, it is a *gas;* if, under ordinary circumstances, the fluid does not so expand, but remains collected in some part of the vessel, it is a *liquid.* The lines of demarkation between these states of matter cannot be sharply drawn; the conditions merge insensibly, the one into the other. Lead is classed as a solid, yet if submitted to suitable pressure, its particles move upon each other, and the given mass takes a new form, as when bullets are made by the cold process from rods of lead. Sulphuric ether is usually a liquid, which, under ordinary conditions, occupies part of a vessel without expanding to fill the whole; but if pressure be removed, as in the receiver of an air-pump, the ether assumes the gaseous form, and resumes the form of a liquid when pressure is restored. Under suitable variations of volume and pressure, part of the liquid may be vaporized, or part of the vapor may be liquefied. Experiments indicate that all liquids may be vaporized, as it is known that all gases and vapors may be liquefied. Substances pass from a liquid to a solid state, or *vice versâ*, with different degrees of abruptness. The change occurs suddenly in most metals, as gold, copper, lead, while iron and glass melt by degrees, and harden slowly; whence it comes that iron and glass can be welded, while gold, copper, etc., cannot. When the particles of water, iron, sulphur, etc., solidify, they arrange themselves according to some law of symmetry, forming crystals; other substances, as pitch, becoming constantly more and more viscous, solidify by imperceptible degrees, and without symmetrical or crystalline arrangement of particles. This quality of viscosity indicates a certain attraction between the particles of a fluid, by which they have some power of resisting the stress to which they ultimately yield. In this respect a series of substances may be arranged, beginning with fluids of extreme limpidity, as water, alcohol, ether, passing through certain oils, molasses, tar, molten glass, that may be drawn out into strings, to the metals which even when cold may be drawn into wire, or rolled into sheets. Prof. Forbes explains the motion of the glacier by the viscosity of ice. A substance may seem to lack this property when struck sharply, and may yet show it under constant, though moderate, pressure; thus pitch, when cold, breaks under the hammer, and slowly bends to fit the surface on which it rests.

A body is said to be *elastic*, if, after its dimensions have changed under the influence of a stress, it resumes its original dimensions when the stress is removed. The numerical ratio of stress to strain, or deformation, is called the *co-efficient of elasticity;* that of strain to stress, the *co-efficient of pliability.* Thus, if 10,000 lbs., applied to a wire of assumed unit of cross section, elongate the wire one per cent, the co-efficient of elasticity of the wire is $\frac{1}{\frac{0}{1}\frac{0}{0}\frac{0}{0}} = 1{,}000{,}000$ lbs. per unit of section. If the stress upon an elastic body be pushed beyond certain limits, different for different substances, the body does not return to its former dimensions, but remains permanently deformed, or may be parted. The limit beyond which the body becomes permanently deformed is the *limit of elasticity.* The limit beyond which it breaks is called the *limit of tenacity.* The body is *soft*, if it may be deformed under a small force; it is *tough* if a large force is required. If rupture occurs before deformation, the body is *brittle;* if it resists great force with neither rupture nor deformation, it is *hard.* The *stiffness* of a body is the measure of its ability to resist deformation; its *strength*, the measure of the force required to break it.

The changes which occur in molecular deformation have been explained thus: We know that the molecules of all bodies are in motion. In fluids the motion is such that any molecule may pass freely from one part of the mass to another; in solids we may suppose that some, at least, of the particles merely oscillate about a certain position so that the configuration of a group of molecules is never much changed from a certain stable form about which they oscillate. If the amplitude of the oscillation exceeds a certain limit, the molecules, failing to return to their old relations, assume new figures of stability, in which the strains are less than in the former figures, and may be zero. This breaking up of configuration may result from wide amplitude of vibration, or from great strain, and we may suppose that the different groups of a mass may have different powers of resistance in either of these respects. We may further suppose that as the groups break up, some of the resulting configurations are such as correspond to a

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strain which is uniform in all directions. In the ratio in which the groups reach this result, the mass approaches the condition of a fluid of greater or less viscosity. If the mass be conceived as made up of molecules which differ in stability of configuration, it is possible that the weaker have yielded to a force which the stronger have been able to resist, and that the latter retain their original condition; that, subsequently, other forces, as change of temperature or of moisture, or violent vibration, may cause a farther disintegration of the groups of low stability; that then the more staple groups have opportunity to control these weaker groups, and gradually restore the whole mass to the condition and form which it had before any deformation occurred.

CONSTITUTIONS, APOSTOLICAL. See APOSTOLIC CANONS AND CONSTITUTIONS.

CONSTITUTIONS OF CLARENDON. See CLARENDON, CONSTITUTIONS OF.

CON'SUBSTANTIA'TION. See TRANSUBSTANTIATION.

CONSUETU'DINARY LAW is that law which derives its binding character, not from the expressed, but from the tacit consent of the general will of the community. As it is generally transmitted from age to age by oral tradition and universal custom, and is rarely embodied in any positive enactment, C. L. is often spoken of as unwritten law (*lex non scripta*) The customary laws of Normandy, Brittany, and some other provinces of France, however, were reduced to writing; and with us much of the common law, both of England and Scotland, now rests on statute, as well as on custom and usage. Even in modern practice, usage is often resorted to as the best interpreter of law. Of this a familiar example is the important part assigned to mercantile usage in construing the law-merchant. In this case, the custom must generally be established by evidence, in place of being taken for granted, as are the laws of primogeniture, legitim, terse, courtesy, and the like. The relation between custom and statute law is discussed under COMMON LAW.

CONSUL, the title of the two highest ordinary magistrates in the Roman republic. The etymology of the word cannot be precisely determined; thus much, however, seems clear, that it implies that there were more than one—that there were colleagues. The idea of two supreme magistrates, or joint-presidents of the state, seems to have been interwoven with the earliest conceptions of political organization in Rome. According to tradition, there were at first two kings; and the constitution of Servius is said to have provided for the sovereign power being again divided between two functionaries. But it was not till after the expulsion of Tarquin that Lucius Junius Brutus and Lucius Tarquinius Collatinus were chosen joint-heads of the state. These chief-magistrates seem to have been at first called *prætores* (leaders, i.e., of the armies), and the title of *consules* to have been introduced about 300 B.C. At first, the consuls seem to have differed from the kings in little else than their limited tenure of office, and the power which their fellow-citizens retained of calling them to account at its termination. They never assumed the golden crown, but their dress in almost every other respect was regal, and they had ivory scepters surmounted by eagles. In public assemblies, they occupied a sort of throne (*sella curulis*), and in the senate they presided and sat on elevated seats. They made peace, and negotiated foreign alliances, had the supreme command of the army, and appointed the public treasurers. They likewise exercised the judicial functions of royalty. In their capacity of supreme judges they continued to be known as *prætores*, until ultimately separate magistrates with that title were appointed. The symbol of their authority was the bundle of rods (*fasces*), with the axe in the center, which was carried before them by twelve lictors. For a considerable period, the consuls were chosen exclusively from the *populus* or patricians, as opposed to the *plebs;* and during the long struggle between the patricians and plebeians, they sided invariably with their own order. At length, however, two plebeian officers, called *tribuni plebis*, were appointed as a sort of democratic rivals to the aristocratic consuls. To them was assigned the duty of presiding in the assemblies of the plebeians, as the consuls did in the other assemblies; and though they could not dictate, they were entitled by their *veto* to arrest measures proceeding on consular or senatorial authority. The result of this rivalry was, that the consulship was opened to plebeians; and from 172 B.C. down to the period of the empire, the consuls were frequently plebeians. In accordance with the ordinary course of political development, the organization of the Roman state became more complicated, in proportion as it became impossible for the C. to discharge in person the various duties which in the beginning always center in the possessors of supreme power. In 442 B.C., censors (q.v.) were appointed. In 365, prætors had the chief judicial functions of the consuls assigned to them. In the government of the provinces, the aid of the former consuls was called in, the C. thus appointed having the title of *pro-consul.* In sudden and critical emergencies, the consuls were either superseded by a dictator (q.v.), or absolute power for the occasion was conferred on them by the decree of the senate, which ran in the famous formula: *Videant consules ne quid respublica detrimenti capiat*—"Let the consuls look to it, that the state take no harm." The oath which the consuls took on entering office they were obliged to repeat as a declaration, not of intention but of fact, on quitting it at the end of the year. The consuls were inaugurated by a great procession to the capitol and a sacrifice to Jupiter Capitolinus. The shadow of the consulate survived the downfall of liberty; but the

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election of the consuls was taken from the people and conferred on the senate. Then their number was increased; they were divided into classes—*C. ordinarii, suffecti, honorarii*, etc.—till at last the office became a mere honorary appointment conferred by the emperor.

The title of C. was revived in the French republic. See CONSULATE.

CONSUL, MERCANTILE, the name given to those officers whom the state maintains in foreign countries for the protection of its trade, and vindication of the rights of its merchants, and to whom the further duty is assigned of keeping the home government informed of all facts bearing on the commercial interests of the country. The practice of appointing such officers originated among the trading communities of Italy about the middle of the 12th c., and gradually extended itself; and in the 16th c., had been adopted by all the countries of Europe. In addition to their commercial duties, others of a more strictly political kind were frequently confided to consuls in places in which there was no ambassador or political agent. In almost all the countries of Europe, consuls are divided into consuls-general, consuls, vice-consuls, and consular agents. The C.'s first duty on his arrival, is to exhibit his commission to the authorities of the country to which he is accredited, in order that he may obtain their sanction to his appointment. This sanction is communicated to him in a document called an *exequatur*, which secures to him the enjoyment of such "privileges, immunities, and exemptions as have been enjoyed by his predecessors, and as are usually granted to consuls in the country in which he is to reside." The general duties of English consuls are communicated to them in printed instructions. In these the C. is ordered to make himself conversant with the laws and general principles which relate to the trade of Great Britain with foreign parts, and with the language and municipal laws of the country wherein he resides. Further, it is his duty to protect his countrymen in the lawful exercise of their trade, to quiet their differences, to obtain the redress of injuries done them—failing which, to report the matter to the English ambassador at the court of that nation—and to forward to the secretary of state for foreign affairs an annual return of the trade carried on at the different ports within his consulate, as well as a quarterly account of the market prices of agricultural produce during each week of the quarter, the course of exchange, etc. The C. must afford relief to British seamen or other subjects wrecked on the coast, and endeavor to procure them the means of returning to England. The commanders of queen's ships touching on the coast are entitled to call on him for intelligence, and aid in procuring supplies of water, provisions, and the like; and it is his duty to endeavor to recover all wrecks and stores, etc., of queen's ships, whether found at sea and brought into the port at which he resides, or thrown on the coast. As regards the "privileges and immunities" of a C., it is doubtful whether he is in any case exempt from the civil jurisdiction of the state to which he is accredited; and in the case of a trading C., it is at any rate plain that he is not. But a C. sent out from Gt. Britain, and not engaging in trade, has always been exempted from the taxes of the country in which he resides. He is generally permitted to call in a guard when he requires it for his own safety, or the preservation of discipline; and in countries not inhabited by a European population, he has all the privileges of an ambassador. A C. can perform all the acts of a notary-public; all deeds executed by him being acknowledged as valid by our courts of law. The fiction is, that the consulate is the territory of the country from which the C. is sent, and, consequently, that deeds and acts done within it, or under the C.'s seal, are done in England. Hence the marriage of British subjects recorded in the books of a British C. is a valid ceremony.

In some cases, British consuls are allowed to trade; in others, they are prohibited from so doing. The salary of consuls-general varies from £300 to £2,000, the average being about £1000; the salary of a consul varies from £100 to £1500, and of a vice-consul, from £50 to £800. A select committee of the house of commons reported in 1872, that the consular service was still too varied in character and arrangements to be the subject of such organization and classification as other branches of the civil service, but in event of such regulation and revision of the posts as was then recommended, suggested that it would be desirable to introduce changes in that direction. Though of opinion that some posts were underpaid, the committee was opposed to an indiscriminate raising of salaries.

The foreign consuls of the United States are appointed by the president and senate, and each one gives a bond of $2000 to $10,000 for the faithful performance of his official duties. Among their powers and duties, they have authority to receive protests or declarations which captains, masters, crews, passengers, merchants, and others make regarding American commerce; they are required to administer on the estate of an American citizen dying within their consular jurisdiction and leaving no legal representative, when the laws of the country permit; to take charge of and secure the effects of stranded American vessels in the absence of a master, owner, or consignee; to settle disputes between officers of vessels and their crews; to provide for destitute seamen, and send them to the United States at public expense, etc. They have also various powers and duties in matters of commerce and trade. In some cases they have stated salaries, but the greater portion are paid by fees. They generally have special privileges under local law or usage; but in civil and criminal cases they are on the same footing with non-official foreign residents owing temporary allegiance to the state. There are

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72 salaried consular offices in the U. S. service, not counting 28 consulates-general, each having a salary of from $2500 to $6000.

CONSULATE (Lat. *consulatus*, consulship), (in France). This supreme magistracy of the French republic was established after the revolution of the 18th Brumaire (q.v.), and lasted to the coronation of Napoleon. On the sudden overthrow of the directory with the constitution of the year III., the members of the council of the ancients and the five hundred, or rather those of them who approved of, or submitted to, that act of violence on the part of Bonaparte's grenadiers, appointed three consuls—Sièyes, Bonaparte, and Roger Ducos. This approach to a monarchical government was confirmed, Dec. 13, 1799, by the constitution of the year VIII., by which Bonaparte was made first consul, with Cambacérès and Lebrun as second and third; each was elected for 10 years, and was re-eligible. The powers of the first consul were made almost absolute. He promulgated the laws, appointed or dismissed ministers, ambassadors, members of the council of state, military and naval officers, and all civil and criminal judges, except justices of peace and members of the court of cassation. His income was fixed at 500,000 francs, and that of his inferior colleagues at 150,000 francs each. Bonaparte took up his residence at the Tuileries, and held a splendid court. By resolutions of the senate, in May, 1802, Bonaparte was re-elected for 10 additional years, and in Aug. of the same year was made first consul for life. In the appeal made to the nation, out of 3,577,259 votes, 3,568,885 were in favor of Bonaparte. The adulation of the senate and people now knew no limit. Nothing but the imperial name and insignia were wanting to complete the picture of absolutism, and these were supplied, May 18, 1804, when Napoleon was made emperor.

CON'SULATE OF THE SEA, a collection of maritime customs and ordinances in the Catalan language, published at Barcelona in the latter part of the 15th century. It contains a code of procedure issued by the kings of Aragon for the guidance of the courts of the consul of the sea, a collection of ancient customs of the sea, and a body of ordinances for the government of cruisers of war. The most valuable portion, *The Customs of the Sea*, has been printed in English in the appendix to the *Black Book of the Admiralty*, London, 1874.

CONSUMPTION, in medical language, phthisis, tabes, marasmus (q.v.), and more particularly phthisis pulmonalis or pulmonary C., is a disease of great frequency and severity, which, in the civilized nations of Europe, produces from one sixth to one tenth of the total mortality in ordinary times. It is uncertain whether there is any part of the world, or any race of men, exempt from C.; this exemption having been at different times claimed for the inhabitants both of hot and cold climates, as for India, Australia, Canada, Iceland, etc., but in most instances in consequence of imperfect knowledge of the facts. On the whole, C. appears to be one of those diseases that have a tendency to increase, unless great care be taken to remove conditions unfavorable to the public health, with the increased aggregation of the human family, and with that extended intercourse which is one of the consequences of an advanced civilization. Hence it is most frequent and most fatal in towns, and most of all in those that are near the great centers of intercourse; while in remote mountain districts, in islands cut off by a wide ocean from the general stream of human communication, it is commonly stated to be, and probably is, comparatively rare. As a rule, however, the presence of this dreadful scourge has almost invariably been discovered to a greater or less extent, wherever the causes of mortality have been carefully examined under enlightened medical superintendence; and we are still very far from having acquired such an insight into its laws of diffusion, as to be able to deduce from them any exact doctrine as to its causation. C. affects peculiarly the young, especially those in the first period of adult life; though it is nearly certain that the seeds of the disease are commonly sown in the constitution in youth, and even in infancy. Its relation to sex is variable, being apparently determined in part by the predominating occupations, and the habits of living, of the population. It is often observed to be plainly inherited from one or other parent, most frequently the mother; and it is one of the diseases which has been stated to be frequently developed as a consequence of the marriage of cousins or other near relatives, especially when the parental stock is itself tainted or not free from suspicion. In life-insurance, all these circumstances are usually carefully weighed by the medical officers of companies, as the grounds for admission or rejection of a candidate for insurance; and nothing is more certain to cause rejection, than a well-grounded suspicion of a consumptive tendency, either personal or derived from the parents, or shown in brothers and sisters. It is therefore a fair subject for consideration, on grounds of ordinary prudence, as well as on those of moral and religious obligation, whether those afflicted with this malady, or strongly predisposed to it, ought to enter into the married state, and to incur the probable afflictions and responsibilities connected with the maintenance of an unhealthy family. It has even been proposed to legislate on this subject; but sober-minded political economists will probably always consider that it is in vain to constrain by laws the strongest instincts of humanity, especially when the application of the law must depend upon such refined distinctions as in the present instance. The subject is clearly one for an appeal to the reason and conscience of individuals, rather than for an attempt to lay down theoretical rules of conduct; but those who would guide their lives by principle, and who would not rush into marriage from the inferior motives alone, would do well to take it into serious consideration.

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Among the determining causes of C. in large populations, the best ascertained are those connected with overcrowding and bad ventilation, especially when connected with all the depressing influences inherent in poverty, or associated with a reckless and abandoned life. It is certain that much might be done to improve the public health in this respect, by more attention on the part of the employers of labor to the comfort and habits of those who are, in more senses than one, their "hands," and the sources of their prosperity. A certain amount of improvement has, indeed, already been effected by the improved living of the working-classes during the last twenty years. Still it is well known, and proved by careful inquiries, that the workshops of tailors, printers, bakers, and other businesses carried on in close, ill-ventilated apartments, by large numbers of workmen, are, in a very aggravated sense, nurseries of consumption. Cotton and linen factories have also been shown, when ill regulated, to be largely responsible for the death of their inmates from this disease. The finest regiments of England were proved, some years ago, by evidence before a royal commission, to be decimated by this disease in time of peace to a frightful extent, in consequence, probably, of the bad ventilation and deficient comforts of the barracks. The cutlers and needle-grinders of Sheffield appear to owe their notoriously short lives to C., brought on by the inhalation of metallic particles in the close and stifling atmosphere of their workshops. The stone-hewers of Edinburgh and Glasgow, and the colliers of the Lothians, were some years ago in a similar predicament, from the inhalation, in the one case of stone-dust, in the other of lamp-smoke not sufficiently diluted with air. And even agricultural laborers, in many parts of the country, suffer from C. to an extent that is quite appalling, owing to the discomforts, and particularly the close and overcrowded condition of their dwellings. It is lamentable to think that such evils as these exist, and that they might be to a great extent avoided; but this conclusion appears to follow legitimately from the evidence that has been adduced of the intimate connection of C. with overcrowding and a diminished supply of fresh air in workshops and dwellings. Some years ago, Dr. Guy published the details of an inquiry into the health of the journeymen printers of London, from which it appeared, in the clearest manner, that the liability of these workmen to spitting of blood, and other well-known symptoms of C., was in exact proportion to the degree to which they had been subject to the evil influences of ill-ventilated workshops; and the marked improvement in the health of our prisons in the present day, has likewise been shown to be to a considerable extent due to the diminished prevalence of C. among the inmates; which, again, is attributed, on good evidence, to the improved construction of the cells, and the increased facilities for wholesome exercise and occupation given to prisoners under confinement for lengthened periods. It has even been plausibly maintained, that in some of our modern jails C. is less prevalent than it is among the general population of the classes from which prisoners are chiefly taken; so that the fact of confinement, and the depressing influences of a penal discipline, are more than counterbalanced by the effect of a regular life, wholesome but plain food, and a sufficient amount of occupation to maintain mind and body in a sound state. Even admitting, therefore, that the causes of C. may be in part practically irremovable, there seems no reason to doubt that very much might be done to diminish its prevalence, as well as to arrest its course when already formed, by due attention to the comfort of the laboring population, both in their dwellings and in the pursuit of their daily occupations.

The general symptoms of C. are patent to every eye; the more accurate appreciation of them, however, and the use of the more strictly medical means for detecting the disease, and judging of its progress and probable issue, are among the more difficult of the duties of the physician. The disease often escapes attention in its early stages; yet not so much from the absolute difficulty of its detection, as from the insidiousness of its invasion, and the small alarm which its early symptoms excite in the mind of the sufferer, and even of his friends, when much occupied with the business of life, or when naturally not gifted with the faculty of refined observation. Whenever a young person appears to lose flesh and strength without known cause, when the color changes much from day to day, and from hour to hour; when shiverings are complained of, or even a sense of too great chilliness, alternated by flushings and an oppressive warmth, or too copious perspiration; when with these symptoms there is cough, however slight, or pains between the shoulders and about the shoulder-blades, or below the collar-bones; when there is an occasional tendency to spit up small quantities of blood from the chest, or when the patient is subject to repeated attacks of catarrh (q.v.), or when the bowels are habitually loose or very irregular, or when with any one of these symptoms in the female there is diminution or suppression of the usual periodic discharges, it is not too soon to apprehend the occurrence of C., and to place the patient under medical advice. In some instances the alarm may appear groundless, and health may rapidly return under appropriate treatment; but a far greater danger is that these symptoms, being overlooked or neglected, may prove only the precursors of a more apparently serious attack of disease, and that the first suspicion of C. may arise only after irreparable mischief has taken place. In general terms, it may be said that during the period of adolescence—i.e., before the body has assumed its full development in regard to strength and weight—no considerable check to its advance in these respects ought to pass unnoticed, more especially if attended with habitual feverishness, cough, or other symptoms of impaired health.

Attempts have been made to show, that a peculiar habit of body or physical con-

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formation, apart from disordered health, is to be regarded as predisposing to C.; and this has been called the phthisical diathesis (q.v.), but little or no dependence can be placed on any such indications, for this disease unquestionably occurs with nearly equal frequency in all the physiological varieties of the human race, when exposed to its exciting and predisposing causes. The experienced eye of the physician, however, will often discover the lurking germs of this insidious malady, even when active symptoms have been long absent, or have recurred after a long period of comparatively good health, by the effect of former disease upon the development of the frame in the period of childhood. For a similar reason, the use of the stethoscope (q.v.), and other means of minutely examining into the state of the chest, will sometimes detect a wholly unexpected attack of pulmonary C. in persons who suppose their lungs to be quite sound, or who have forgotten that they were ever subject to disease. As a rule, however, the symptoms mentioned above are pretty safe guides as to the commencement of C., if care be taken that their gradual progress does not cause them to be overlooked. In a few cases the disease begins otherwise, the form being that of an acute attack, such as fever or inflammation of the chest; but such cases are of course at once detected, as being serious enough to require medical advice.

The further medical history of C. is very complicated, and can hardly be treated of with advantage in a work like the present. Generally speaking, the progress of the disease is marked by the following symptoms: progressive emaciation, with habitual fever and frequent sweating at night; cough and pains in the chest, with expectoration of mucus, and, in the end, of purulent matter in large quantities; diarrhœa (q.v.), and sometimes obstinate vomiting, oftener failure of the appetite, with occasional sickness; gradually increasing weakness and indisposition for active exertion, often with more or less difficulty of breathing on exertion, but rarely with extreme distress or pain of any kind. This remarkable freedom from acute suffering is probably one reason of the self-deception usually attributed to consumptive persons, by which they are led to believe in their curability up to a very advanced stage of the disorder.

The degree to which C. is curable has been a fruitful subject of discussion of late years. Properly speaking, there never has been any doubt that cases marked by all the symptoms of C. occasionally, and even pretty frequently in the early stages, get well; but it was argued that these were probably not genuine instances of what is now alone technically called C.—viz., tubercular disease. In France, where morbid anatomy was extensively cultivated in the beginning of the present century, the incurability of the tubercular form of C. was a general doctrine of the schools till the time of Laennec (q.v.), who, by multiplied instances, and careful observations on the dead body, showed beyond all question the occasional arrest even of advanced C., and the frequent cure of it in the early stages. The appearances in the lungs, and other organs of persons affected with C., will be discussed under TUBERCLE.

The treatment of C. is a very complicated subject, and one much misunderstood, partly owing to the misrepresentations of quacks, and partly from the great demand for palliative remedies on the part of patients and their friends, tending to obscure the true principles of treatment even to the mind of the physician. It is, however, now well ascertained that the greater part of the cure consists in hygienic measures—i.e., the regulation of the mode of living, the occupation, the diet, the clothing, the food, the hours of repose, etc., of the consumptive—and all treatment by drugs is usually regarded by well-informed physicians as subordinate to that just mentioned. A life in the open air to a considerable extent, and in a climate which admits of the enjoyment of such a life even in winter, is the best restorative in cases of incipient C.; yet too much may be sacrificed to the desire of obtaining these advantages, if a genial climate is sought at the expense of the comforts of one's own home, or with the effect of producing anxiety of mind, or exhaustion of body by a long and fatiguing journey. Moreover, to many men a regular occupation is really a necessity in more senses than one; and to break up all the associations of habit in a person debilitated by disease, and not capable of seeking new sources of excitement, is to poison the springs of enjoyment, and render the remainder of life a burden. Many consumptives have been sent abroad only to die, and in all probability to die more miserably, and at an earlier period, than if they had remained at home. On the other hand, the favoring influences of climate are by no means to be rejected, when they can be obtained in accordance with the patient's previously formed habits, and with due regard to his means of occupation and prospects of eventual cure. A varied and wholesome, but light and unstimulating diet, including abundant dairy produce; flannel coverings next the skin, and clothing which is warm but not oppressive; a well-ventilated sleeping-apartment, with a moderate fire in cold weather; bathing in tepid water; the use of a respirator or of a light woolen covering for the mouth and nose in excessively cold weather; avoidance of late hours, crowded rooms, and every kind of dissipation; avoidance also of draughts of cold air, and of sitting in damp clothes or with damp feet; these are the principal circumstances to be kept in view in the ordinary regulation of the life of a consumptive patient. The use of cod-liver oil has been very popular of late years in the treatment of C.; but it may be reasonably doubted whether the reputation of this remedy be due to its powers as a medicine or simply as a fattening food. Occasional small opiates, and other medicines to arrest irritating cough and subdue feverishness, and in special cases the treatment proper to the complications, such as diarrhœa (q.v.) and breathlessness, are generally admitted as useful adjuncts to the means above mentioned; but they can hardly

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be discussed in this place with advantage, and should be in general used only under medical advice.

The Koch Treatment for Consumption.—In 1882 Dr. Robert Koch, of Berlin, showed and isolated that microscopic organism, the *bacillus tuberculosus*, a tiny parasite which measures .0001 of an inch. Its action is like that of a mole. It burrows and throws up its mound of "gray granulations," and these little living rods multiply with great rapidity. They can only flourish in suitable soil. What Koch showed conclusively in regard to this bacillus was (1) that it was present in every case of tuberculous disease; (2) that it never was found except associated with such disease; and (3) that if cultivated outside the body and injected into a healthy animal it would invariably engender tuberculous disease. The cause of the disease having been ascertained, it was natural to expect that the discovery of a remedy would follow as a matter of course. In 1890 Dr. Koch announced that he had succeeded in discovering a remedy, popularly designated as "lymph," which, injected into the patient, destroyed the tubercle bacilli. In January, 1891, he published a guarded account of the manner of preparing the "lymph," from which it appeared that the remedy is developed from the bacilli themselves, combined with certain ethereal oils. It is probable that Dr. Koch worked with the bacillus, not in man or the lower animals, but with the germs of his own cultivating in his glass or porcelain receptacles. Dr. Koch found that a large number of substances, such as various ethereal oils and compounds of cyanogen and gold, arrested the growth of tubercle bacilli. What might be available in the glass test tube, destroying the bacilli and leaving untouched the vessel, might have been dangerous when administered to the man. What Koch tells us of the effects of the remedy should be perfectly understood in order to dissipate false illusions. If the lymph be injected, the average dose being one centigram for the healthy person, it produces no effect; but if the patient be suffering from any form of tuberculosis, "it causes fever of greater or less intensity, with the usual accompaniments of such systematic disturbances." The remedy has "a specific action on tuberculosis processes of every kind, which shows itself in the form of what is practically an attack of acute inflammation of the affected parts." It is known from the careful studies made by physicians in the United States that the effect of the lymph on those afflicted with lupus are visible. What was absolutely taking place on the surface of the human body and discernible could not be visible inside the patient, but we could be entirely justified in our belief that with the same cause the identical effects were being produced within the lungs of the patient. What Koch claims is that the lymph is "an indispensable aid to diagnosis," or, as Sir Morel Mackenzie aptly puts it, "No reaction, no tubercle." As to the potency of the fluid, Koch informed Sir Joseph Lister "that the undiluted fluid probably contains only about a thousandth part of the really active ingredient. If, therefore, one milligram of the fluid is injected—and this is the dose not infrequently given to begin with—only one-millionth of a gram of the active principle enters the system." The energy of the leading substance in the lymph must be prodigious, for if M. Pasteur's statement be credited, no venom of snake if administered in such an infinitesimal dose could produce such enormous effects. What is known as oubain, a glucoside recently derived from a new vegetable substance, is supposed to have powerful toxic qualities. One-eightieth of a milligram will kill a rabbit in eight minutes if injected into its veins, but this is impotent, apparently, when the powers of the Koch lymph are contrasted with it. As to the ultimate and permanent results upon consumptive patients to be derived from the use of the Koch treatment, it is now too soon to speak definitely. Dr. Koch. himself, is most conservative in his claims. He does believe, however, that phthisis is curable, while not guaranteeing that the cure will be lasting. He does not even trust exclusively to the new treatment, even in the early stages of consumption, for he attaches considerable importance to such adjuvants as mountain climate, fresh air, diet, and nursing. See BACILLUS; BACTERIUM; MICROBE; KOCH, ROBERT; TUBERCULINE.

CONSUMPTION, a term employed in political economy to signify the withdrawal of wealth from the market and the application of it to a special use. It does not necessarily signify the destruction of the commodity thus withdrawn, as for instance, stones in a building may be said to be consumed, since they are no longer available as commodities for purchase or sale, but they may be at the same time in as good a condition as before they were used in building. Consumption constitutes one of the four time-honored departments of political economy, namely, production, exchange, distribution, and consumption, but in recent years it has become the practice among the most advanced political economists to disregard the hard and fast lines of division between these departments. How closely related, for instance, the consumption of wealth is to its production, appears from the various effects of the consumption of different kinds of wealth upon the productive efficiency of the wealth-producer. It has been divided into productive and unproductive consumption, the former being such as places the producer in a more favorable position for the creation of wealth in the future; the latter being the consumption of such things as do not in any way contribute to his productive efficiency. A common fallacy, which has been often refuted by political economists, is the belief that the consumption of wealth is of itself a good thing, in that it gives a "fillip to trade." Apart from the social effects of the direction of consumption into certain lines, the expenditure of wealth can never be a subject of indifference from an economic point of view, for it determines the investment of capital, the demand for labor, and, in fine,

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reacts upon all departments of economic activity. Among important laws, set forth in recent times, may be mentioned the so-called Weber's law, that, as the consumption of a given article increases, the consumer is willing to sacrifice proportionately less in order to obtain each increment. The price which he pays for the commodity will be measured by its *final utility*. See VALUE. Engel's law, developed by the Prussian statistician Engel, from observations extending over a term of years, is that a demand for necessaries does not increase proportionately with the increase of wages, but that, with their advance in economic prosperity, men apply more and more of their wealth to the gratification of pleasure, social ambition, etc. Thus it appears from a study of consumption that the general rule in regard to supply and demand, namely, that an increase of supply tends to lower the price, and so stimulate a proportionately greater demand, finds an exception in the case of articles that minister to the most pressing wants. After a certain point is reached, the lowering of the price of food will not stimulate a proportionately higher demand for food products.

CONTACT. In geometry, two lines, one of which at least is curved, are said to be in C. when they have a common point from which they recede, in such a way that the deflection of the one from the other will, if a sufficiently small departure be taken, become as small a fraction as we please of that departure. A complete discussion of the nature and order of C. can be obtained only by means of the differential calculus.

CONTAGION, the communication of a disease from the sick to the healthy, either by direct contact of a part affected with the disease, or through the medium of the excretions and exhalations of the body. Some authorities have employed the term infection (q.v.) to designate this latter method of communication, and have correspondingly limited the meaning of the word C.; but no practical end is served by this refinement, and it has indeed led to great confusion by obscuring the fact of the communication, which is, when clearly proved by instances, the most important element in the inquiry. If of a given number of healthy persons exposed to association with the sick, a much larger proportion becomes ill than can be reasonably accounted for on general principles, or than is actually observed among persons of similar habits not exposed to this cause of disease, the disease is said to be propagated by C.; and if the characters of the disease are well marked, and nearly similar throughout the group of cases, it is said to be due to a specific C., which may be in some cases shown to be capable of reproducing the primary disease to an illimitable extent, being conveyed (as in the case of syphilis, q.v.), either through the liquid secretions of the affected part, or (as in the case of small-pox) in this way, and also through the aërial exhalations. Contagious diseases are generally epidemic (q.v.) in their mode of propagation, attacking large numbers of people at once, and traveling from place to place. But some epidemics are not contagious, as influenza (q.v.).

CONTAGIOUS DISEASES (WOMEN) ACTS. See PROSTITUTION.

CONTANGO, a term in use among stock-brokers in England. Accounts between brokers are settled twice per month, each settlement covering a period of three days, the last of which is the true *settling day*. The settlement of any bargain or money transaction may be deferred from one *settling-day* to another—that is, for another fortnight. For this privilege a consideration is charged, called *contango*, if the buyer defers settlement, and *backwardation* if the seller defers. The first of the three days of each fortnightly settlement is known as the *Continuation* or *Contango* day, when all transactions of a merely speculative description are continued for another fortnight.

CONTARI'NI, the name of a noble family in Venice, one of the twelve that elected the first doge. Between 1041 and 1674, seven doges were furnished by this family, and several of its members were men of note.—AMBROGIO C. was sent as ambassador from Venice to Persia, 1473–77, and gave an account of his travels in his *Viaggi fatti da Vinetia, alla Tana, in Persia, in India, et in Constantinopoli* (Ven. 1487).—CARDINAL GASPARO C. distinguished himself as Venetian ambassador at the court of Charles V., and was papal legate at the diet of Ratisbon, 1541, where he displayed great moderation.—GIOVANNI C., b. 1549, was one of the most famous painters of his time; he painted the "Resurrection," in San Francisco di Paolo's, in Venice.—VINCENZO C., b. 1577, had acquired, at the age of 26, such a fame for learning, that the magistrates of Padua, in order to secure him for their university, established an extraordinary professorship of Greek and Latin eloquence.

CONTEMPORANEITY is a term used in geology to imply that the various systems or formations were accumulated in the same order. If a geologist speaks of the Silurian systems of America and Europe as contemporaneous, he does not mean that they were necessarily formed at the same time, but that they bear the same relative positions to the other systems, i.e., each was preceded by a Cambrian, and followed by a Devonian, and yet the formation of these systems may have extended over hundreds of years longer in the one area than in the other. Prof. Huxley has suggested that the term *homotaxis* (similarity of succession) be used instead of contemporaneity.

CONTEMPT, against the sovereign's title. See PRÆMUNIRE.

CONTEMPT OF COURT very generally manifests itself in the disregard by an inferior court of the orders of a superior court, by the non-payment of costs, the misconduct of ministerial officers, and by the malpractices of attorneys; and may be punished summarily without trial. In this country, great license is given to the press in

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their comments on cases before court; in some states, it is even permissible to criticise evidence. In most states, contempt of court is carefully regulated by statute.

CONTEMPT OF PARLIAMENT. See PARLIAMENT.

CONTI, HOUSE OF, a branch of the house of Condé (q.v.). Armand de Bourbon, first prince of C., and brother of the great Condé, was b. at Paris in 1629. He took his title from the little town of Conti, situated five leagues from Amiens. Of a feeble constitution and deformed shape, he was early destined for the church, but the fame of his brother inspired him with military ardor. He commenced his martial career as the opponent of his brother, but soon entered into alliance with him. After 1657, he retired from the world, and gave himself up, without reserve, to devotion. He died at Pezenas in 1666.—LOUIS ARMAND, prince de Conti, comte de Pezenas, and peer of France, eldest son of the preceding, was born in 1661. After a short career in arms, he died of small-pox at Fontainebleau, 5th Nov., 1685. He left no children, and was succeeded by his brother FRANÇOIS LOUIS, prince de la Roche-sur-Yon et de Conti, who was born at Paris in 1664. This was the most remarkable member of the family. Educated under the eyes of the great Condé, he early conceived a passion for bearing arms. His first campaign was made in Hungary, where he distinguished himself; but having fallen into disgrace with the court, he was banished to Chantilly, with strict orders not to leave it. The great Condé, before his death, persuaded Louis XIV. to pardon him. Subsequently, C. served under the duc de Luxembourg, who was warmly attached to him, and took a brilliant part in the victories of Steinkirk and Neerwinden. In 1697, he narrowly escaped being made king of Poland. On his return to France, he was still coldly received by Louis, who, however, was at last forced by disaster to employ him. He received the command of the army of Flanders in 1709, but died on the 22d of Feb. of the same year. Massillon pronounced his funeral oration. Saint-Simon, in his celebrated *Mémoires*, thus speaks of him: "He was the delight of armies, the divinity of the people, the hero of officers, the darling of parliament, and the admiration of the most learned savans."—The last member of the house of C. was LOUIS FRANÇOIS JOSEPH, b. 1784, d. in Spain, 1807.

CONTINENT. Though no mathematical distinction has ever been drawn between a C. and an island, the usage of language has generally recognized five great masses or divisions of land as continents—Europe, Asia, Africa, America, and Australia. Europe, Asia, and Africa form properly one great C., the only one known to the ancients; the second was discovered by Columbus; and the third made its appearance at the antipodes of Europe in the beginning of the 17th century. The existence of an antarctic C. has not yet been satisfactorily established. The apparent irregularity in the shape of the continents disappears on nearer examination, and certain uniformities become apparent, the causes of which have long been subjects of speculation. Bacon remarked, that the continents were pointed towards the south polar sea, and presented broad conformations toward the north. J. R. Forster followed up this remark by the generalization, that these southern points are the ends of mountain-ranges, which are continued northwards; and that at the e. side of these promontories there are always larger or smaller archipelagos of islands, while the w. side of the continents is indented with large bays.

Not only have attempts been made to reduce the horizontal outlines of the continents to rule, but their vertical dimensions have been examined with the same view. Observation had been confined to ascertaining the heights of individual summits, until Alexander von Humboldt enriched physical geography with a new numerical element, by endeavoring to determine the mean height of continents—i.e., the elevation of the center of gravity of their mass. He estimated the mean height of Europe at 108 toises (a toise is about 6 ft. 6 in.), of North America at 117, of South America at 177, and of Asia at 180 toises. Laplace had calculated the mean height of all the continents at 1000 meters; Humboldt found this too great by two thirds, and gives the height of the center of gravity of all the continents, except Africa, above the sea-level at 307 meters, or 1007 feet.

CONTINENTAL, a term intended as the opposite of provincial, assumed by the revolted American colonies early in the war of the revolution, an effort being made to induce Canada to join the thirteen colonies. Had the Canadians agreed, the whole of the continent under English rule would have been in revolt. The first general representative body of the thirteen colonies was called the "Continental Congress."

CONTINENTAL SYSTEM; BERLIN DECREE; ORDERS IN COUNCIL. The C. S. was the name given to Napoleon's plan for shutting England out from all connection with the continent of Europe, and thus compelling her at least to acknowledge the maritime law as established at the peace of Utrecht. See NEUTRALS. This system began with Napoleon's famous "Berlin decree" of Nov. 21, 1806, which declared the British islands in a state of blockade, and prohibited all commerce or correspondence with them; every Englishman found in a country occupied by French troops or by their allies was declared a prisoner of war; all merchandise belonging to an Englishman, lawful prize; and all trade in English goods entirely prohibited. No ship coming direct from England, or from a British colony, was allowed to enter any port; and any ship seeking by false declarations to evade the regulation, was confiscated with its cargo as if British property.

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England was not long in making reprisals. By an "order in council," issued Jan. 7, 1807, all neutral vessels were prohibited from entering any port belonging to France or her allies, or under her control. Every neutral vessel violating this order was to be confiscated with its cargo. Still more oppressive for neutral commerce was a second order in council of Nov. 11, 1807, by which all harbors and places of France, and her allies in Europe and the colonies, as well as of every country with which England was at war, and from which the English flag was excluded, were placed under the same restrictions as if strictly blockaded. These orders were followed by reprisals on the French side. By the Milan decree of Dec. 17, 1807, strengthened by a second of Jan. 11, 1808, from the Tuileries, any vessel, of whatever nation, that had been searched by an English ship, had submitted to be sent on a voyage to England, or paid any duty to the English government, was to be declared *denationalized*, and treated as English. In order the more effectually to annihilate English commerce, there appeared, Aug. 3, 1810, the tariff of Trianon for colonial goods; this was extended by a decree of 12th Sept., and on the 18th Oct. followed the decree of Fontainebleau, ordering the burning of all English goods; an order which was to be carried out with more or less modification in all countries connected with France.

The consequence of the C. S. was undoubtedly the springing up on the continent of many branches of manufacture to the prejudice of England; on the other hand, the price of foreign produce rose to an extraordinary height on the continent, enabling a few commercial men to make fortunes, but sensibly affecting the daily comfort of the middle classes. This violent interruption of human intercourse and sociability was an unnatural condition, which could not last long, and could only serve to strengthen the hatred of Europe against French tyranny. Accordingly, with the breaking up of Napoleon's power, the C. S. fell to the ground.

CONTINGENT is the quota of troops furnished to the common army by each member of an alliance or confederation of states. The word was especially applied to the proportions contributed by the several German states to the army of the confederation.

CONTINUED FRACTIONS. See FRACTIONS.

CONTINU'ITY, LAW OF, a principle made known by Leibnitz, which asserts that nothing passes from one state to another without passing through all the intermediate states.

CONTINUOUS STYLE, a peculiar style of architecture more commonly known as the *perpendicular* (q.v.).

CONTORNIATE (Ital. *contorno*, Fr. *contour*), a term applied to a class of antique medals which have a deep line cut round the edge, like a furrow.

CONTORTED STRATA are beds which are bent and twisted, so that in a section their edges would be seen to follow crooked and curved lines, often doubling back and running altogether out of their former course. See APPALACHIANS.

CON'TRA, a term in music, meaning opposite, lower, and applied to the alto and tenor parts when they form the lowest part in the harmony. When a part lower than the usual bass is employed, it is called contra-basso. C. is also used in organ-building, to indicate that a certain stop, or register of pipes, is an octave lower than the usual pitch.

CONTRABAND. A term humorously applied during and after the American Civil War to a negro refugee The name was first employed in this sense in 1861, when Gen. B. F. Butler in command at Fortress Monroe, officially decided that negroes were lawfully to be regarded as "contraband of war," as belonging to the enemy, and hence were to be retained and employed by the Union forces.

CONTRA BASS, or VIOLONE, the largest species of stringed instrument, commonly called the double bass. In Britain, this class of instrument has three strings, the lowest being A, a minor third below the low C of the violoncello; the next is a fourth above, viz., D; and the highest is G, a fourth above D. This manner of stringing is defective, as all the great masters have written for the C. B. down to E, for which reason the German instruments have all four strings, the lowest a fourth below our low A.

CONTRA-BASS TUBA. See TUBA.

CONTRABAND OF WAR (Lat. *contra bannum*, against the proclamation), is a name applied to certain commodities, or the rules relating to them, during hostilities between states which acknowledge what are called the laws of nations. One such law is, that neutral nations must not carry on, for the advantage of either of the belligerent powers, any branches of commerce from which they are excluded in time of peace. Another is, that the name of C. of W. shall be given to such articles as pertain to military or naval warfare—guns, ammunition, and stores of all kinds. Unless there are special treaties, defining exactly what articles are C. of W., the interpretation of this law often leads to much embarrassment. Another law insisted on by England during the last great war was, that each belligerent shall have a right to visit and examine neutral ships, to see whether they carry any articles which are C. of W., and which seem likely to be intended for the enemy. A neutral state may carry on ordinary trade with either belligerent, except when prevented by blockade (see BLOCKADE); but the ships,

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according to the above rules, must not contain articles C. of W.; nor must a conterminous land frontier be crossed by such commodities. If a merchant evades these rules, he does so at his own risk; his merchandise may be seized, and his own government will not protect him. By the law and practice of nations, it is for the admiralty court of the capturing power to decide what is or what is not contraband of war. Upon such questions it is the province of this tribunal to adjudicate; and from its final judgment there is no appeal. At various times, discussions have arisen whether corn, hay, or coal, can ever be included in the list of articles C. of W.; they are obviously articles of peaceful commerce, but they are also essential to the maintenance of an army, and sometimes a supply would give one belligerent a great advantage over the other. Especially is this the case in reference to coal, in the present age of war-steamers.—Contraband in commerce depends upon the special laws of each country. See SMUGGLING.

CONTRA COSTA, a co. in w. California, on San Francisco and Suisun bays, 810 sq.m.; pop. '90, 13,515. In the s. portion are several mountains, the chief of which is Mt. Diablo, but most of the surface is level, and the soil is fertile. Salt and sulphur springs are numerous, and there are valuable coal-mines. Quicksilver and copper also are found. Chief productions, wheat, oats, barley, hay, cheese, butter, wool, and wine. Co. seat, Martinez.

CONTRACT. For a statement of the principles on which contracts in general are founded, see CONSENT.

CONTRACT (see CONSENT), an agreement between two or more parties to do or not to do a particular thing. There are several varieties of contract besides the ordinary agreement which almost every person understands. The chief of these are: Accessory contracts made to assume the performance of a prior contract, such as a suretyship, mortgage, etc.; a contract of beneficence, where only one of the parties is benefitted, as loans, deposits, etc.; certain contracts in which the thing to be done is supposed to depend on the will of the party, or when, in the usual course of events, it must happen in the manner stipulated; commutative contracts, in which what is done, given, or promised by one party, is considered an equivalent to, or in consideration of, what is done, given, or promised by the other; consensual contracts, formed by the mere consent of the parties, such as hiring out; executed contracts, those in which nothing remains to be done, as in a sale with payment and delivery on the spot; entire contracts, where the consideration is entire on both sides; executory contracts, in which some act remains to be done, as an agreement to do a certain thing at a future time; express contracts, where the terms of agreement are openly uttered and avowed at the time of making; gratuitous contracts, in benefit of the person with whom made, without profit or advantage received or promised as a consideration; hazardous contracts, in which the performance depends upon some uncertain future event; implied contracts, such as reason and justice dictate, and which the law presumes that every man undertakes to perform; independent contracts, in which the neutral acts and promises have no relation to each other as equivalent or considerations; mixed contracts, where one of the parties confers a benefit on the other, receiving something of inferior value in return; contracts of mutual interest, entered into for the common and reciprocal interest of both parties, such as partnership; onerous contracts, where something is given or promised as a consideration for the engagement or gift, or some service, interest, or condition is imposed on what is given or promised, although unequal to it in value; oral contracts, ordinary simple agreements; principal contracts, where both parties act on their own account; real contracts, where there must be something more than mere consent, such as a loan, pledge, or deposit, which from their nature require the delivery of the thing itself; reciprocal contracts, mutually agreeing together in business, such as sales, hire, and the like; contracts of record, such as are evidenced by record made, such as judgments, recognizances, etc. (The foregoing are the higher class of contracts.) Severable contracts are those in which the considerations are, by their terms, susceptible of division on either side, as agreeing to pay for a certain work as long as it is done in a certain way. Simple contracts are the lowest form of contracts; mere non-recorded parol agreements. Unilateral contracts are those in which the party to whom the engagement is made makes no express agreement on his part. As to the qualities of contracts, the agreement should be so complete as to give either party his action upon it, and both parties must assent to all its terms. There must be a good and valid consideration. The thing to be done must be one not forbidden by law; immoral as well as fraudulent contracts are void, and so are contracts against public policy, even though not forbidden by statute. The intention of the parties is the marrow of the contract, and this is the key for construction by a court. Words are, if possible, taken in their comprehensive and common-sense meaning. See LAW OF CONTRACTS.

CONTRACTIL'ITY, the property by which the particles of certain substances resume their normal position when the force that pulls them apart is suspended. Contractility is also the power in animal muscles by which the limbs are moved.

CONTRACTIONS. The wish or necessity of economizing labor and parchment, led the scribes of the middle ages to use a great many abbreviations or C. in their manu-

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scripts. These C. were transplanted into the first printed books; and more recently they have been reproduced in many works, as well in this country as on the continent, where it was thought desirable that the modern print should represent as nearly as possible all the peculiarities of the ancient manuscript. A knowledge of C., therefore, is indispensable, not only to readers of old writings, but to readers of the printed books of the 15th, the 16th, and the earlier part of the 17th centuries, and to all who desire to avail themselves of the vast stores of historical and archæological materials accumulated in the rolls and records published by the governments of Great Britain, France, and other countries.

C. may be divided into six classes: 1. C., properly so called; 2. C. by elision or suspension; 3. C. by writing a smaller letter above the word contracted; 4. C. by running two or more letters into one character; 5. C. by symbols representing syllables or words; 6. C. by initial letters.

1. *Of C., properly so called*, there are three great kinds: (I.) A straight line over a letter denotes the omission of an *m* or an *n* after it.

(II.) A crooked or circumflex line over or through a letter signifies that one or more letters are omitted after it—occasionally both before and after it.

(III.) The sign ꝛ over a letter shows that *er*—or occasionally *re*—is omitted after it.

2. *In C. by elision or suspension*, the word is not fully written, the want of the terminating letters being denoted by the marks ⁻ᵒ, or ', or .; thus: ass ⁻ᵒ, *assisa;* test', *teste;* dat., *datum;* temp., *tempore.*

3. *C. by writing a smaller letter above the word contracted.*—If the letter so written be a vowel, it denotes the omission of a consonant; if a consonant, the omission of a vowel. Occasionally the omission extends to two or more letters, whether vowels or consonants.

4. *Of C. by running two or more letters into one character*, the diphthongs æ and œ, and the sign & for *et*, are familiar examples.

5. *C. by symbols representing syllables or words.*

6. *Of the more common C. by initials*, a list has already been given in this work, under Abbreviations (q.v.). In this way of writing, a whole sentence may be expressed without so much as one word being written at length, as in the well-known epistolary form S.V.B.E.E.Q.V.; that is, *Si vales, bene est, ego quidem valeo.* Among the initials used in old writings and books, it will suffice here to mention the following:

A.	Alexander, Alanus, Arthurus.
B.	Benedictus, Bernardus, Bonifacius.
B.M.V.	Beata Maria Virgo.
B.P.	Beatus Paulus, *or* Petrus.
B.V.	Bene vale.
C.TT.	Cardinalis Tituli.
D.	David, Durandus, Duncanus.
D.N.PP.	Dominus Noster Papa.
E.R.	Ecclesia Romana.
F.F.F.	Fiat, Fiat, Fiat.
G.	Gulielmus, Gilbertus, Guido, Georgius.
G.G.	Gregorius.
I.C. or I.X.	Jesus Christus.
I.D.N.	In Dei Nomine.
J.	Johannes, Jacobus, Julietta, Josephus.
M.	Malcolmus, Martinus, Matilda, Maria.
N.E.R.	Notarius Ecclesiæ Romanæ.
O.S.B.	Ordinis Sancti Benedicti.
P.S.R.I.	Princeps Sacri Romani Imperii.
R.	Robertus, Rolandus, Ricardus.
R.P.D.	Reverendissime Pater Domine.
S.	Symon, Samuel, Siwardus.
S.C.M.	Sacra Cæsarea Majestas.
S.D.	Salutem Dicit.
S.D.N.R.	Supremus Dominus Noster Rex.
S.M.E.	Sancta Mater Ecclesia.
S.P.	Sacri Palatii.
S.R.E.	Sacra Romana Ecclesia.
S.V.	Sanctitas Vestra.
T.	Thomas, Turgodus, Thoraldus.
V.R.P.	Vestra Reverendissima Paternitas.
V.S.	Vestra Sanctitatis.
W.	Wilhelmus, Walterus, Wido.

Doubling an initial, shows that it is to be taken in the plural sense, as PP. for Papæ, TT. for Tituli, MSS. for manuscripts. See ABBREVIATIONS.

C. Corrupted.—The Anglo-Saxon denoting *th*, has been corrupted into *y*; whence yᵉ is put for *the*, yʳ for *their*, yⁿ for *then*.

Collections of C. have been engraved in *fac-simile* in several works, among which may be enumerated Baring's *Clavis Diplomatica*, Hanov. 1787 and 1754; Anderson's *Dip-*

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lomata Scotiæ, Edin. 1789; Walther's *Lexicon Diplomaticum*, Gotting. 1745; the *Nouveau Traité de Diplomatique*, Paris, 1750–65, one of the many noble works of the Benedictines of St. Maur; Lemoine's *Diplomatique Pratique*, Metz, 1765; Trombelli's *L'Arte di conoscere leta de' codici Latini ed Italiani*, Bologn. 1756 and 1778; M. Nat. de Wailly's *Eléments de Paléographie*, Paris, 1838; M. L. Alph. Chassant's *Paléographie*, Paris, 1839 and 1854, and his *Dictionnaire des Abréviations*, Evreux, 1846.

CONTRADICTORY PROPOSITIONS are those which have the same terms but differ from each other in *quantity* and *quality*. In point of quantity, propositions are classified as *universal* and *particular*, according to *quality*, as *affirmative* and *negative*. Universal propositions assert that the predicate belongs to the whole of the subject, as, "All metals are elements." Particular propositions affirm the predicate of a portion of the subject, as, "Some metals are elements." Affirmative propositions assert a certain agreement between the subject and the predicate, as, "Gold is a metal." Negative propositions assert some difference between the subject and the predicate, as, "Gold is not a metal." An example of contradictory propositions would be: "All metals are brittle" and "some metals are not brittle." These differ in *quantity*, since the first is universal and the other particular, and in *quality*, since the first is affirmative and the other negative. To prove the falsity of the first, it is necessary merely to show the truth of the second. Of contradictory propositions, one must be true and the other false.

CONTRA-FAGOTTO, the name in orchestral scores for the double bassoon.

CONTRALTO. See ALTO.

CONTRAPUNTAL. See COUNTERPOINT.

CONTRARY MOTION, a term used to denote the progression of themes, or parts of a movement in opposite directions, ascending and descending.

CONTRAT SOCIAL. See GOVERNMENT; ROUSSEAU, JEAN JACQUES.

CONTRAVENTION, in the law of Scotland, any act done in violation of a legal condition or obligation. The term is most frequently applied: 1. To an act done by an heir of entail, in opposition to the provisions of the deed; 2. To an act of violence or molestation, in opposition to Lawburrows.

CONTRAYER'VA, a medicine once in much repute against low fevers, and as a mild stimulant and diaphoretic, and still used in some countries, although not much in Britain, consists of the root-stocks (rhizomes) of different species of *dorstenia*, a tropical American plant of the natural order *moraceæ*. The genus is remarkable for the plane receptacle in which the numerous small flowers are fixed; the male flowers in superficial depressions, the female flowers in deep sockets. The flowers have neither calyx nor corolla. The fruit consists of *achenia*, imbedded in the fleshy receptacle from which they are projected by elastic force when ripe. *D. contrayerva* is a perennial plant, with palmate leaves, and somewhat quadrangular receptacles. Its root-stock is knotty, 1 to 2 in. long, about ¼ in. thick, reddish-brown, pale within, sending out on all sides many slender fibers (roots), which are generally loaded with small brown knots. It has a peculiar aromatic, overpowering smell, and a somewhat astringent, warm, bitterish taste. It keeps badly. It contains so much mucilage, that a decoction of it will not pass through a filter.—*D. Brasiliensis*, a stemless species, with oblong, heart-shaped leaves and a circular receptacle, a native of the West Indies and Brazil, possesses similar properties, but is said to be more energetic, and furnishes the C. of British commerce. Other species possess similar properties. They have been also represented as efficacious against serpent-bites, and hence the name C., a *counter-poison*.

CONTRE DANSE. See COUNTRY DANCE.

CONTRE'RAS, a village about 12 m. s.e. of the city of Mexico, where a battle occurred between the Americans under Gen. Scott and the Mexicans under Gen. Valencia. It was a part of the battle of Churubusco.

CONTRETEMPS (Fr. *contre*=Lat. *contra*, against, *temps*=Lat. *tempus*, time), an unexpected accident, an unforeseen event, out of harmony with the times and which throws everything into confusion. The term may be hit off well by the expression, a "hitch."

CONTROL'LER, an officer whose duty it is to keep financial accounts, or to see that they are properly kept and audited. In the U. S. treasury department there are the first and second controllers to examine accounts and sign drafts; and also a controller of the currency, who furnishes circulating notes to banks. In some of the states, as New York, a controller is elected by the people who has general charge of the financial affairs of the state. There is also a controller in the city of New York, elected by popular vote. Also spelled COMPTROLLER.

CONUNDRUM, a pun in the interrogative form, a kind of riddle (q.v.) involving the discovery of some odd or absurd resemblance between things utterly dissimilar, or of some odd difference between similar things. The conundrum is usually in the form of a question, the answer to which either is or involves a pun. The conundrum has almost entirely supplanted the riddle, save in folklore and savage life. The origin of the word conundrum is by no means clear. Skeat has suggested that it may be from the Latin *conandum*, meaning something to be attempted.

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CONVALLA'RIA. See LILY OF THE VALLEY.

CONVENT. See MONASTERY.

CONVENTICLE (Lat. *conventiculum*, a diminutive of *conventus*), originally meant a cabal among the monks of a monastery, formed to secure the election of a favorite as abbot. The word consequently fell into disrepute. It was first given as an appellation of reproach to the assemblies of Wickliffe's followers, and was afterwards applied to the meetings of the English and Scottish non-conformists.

CONVENTION, NATIONAL. See NATIONAL CONVENTION.

CONVENTIONAL, in art, is that which is in accordance, not with the absolute principles of beauty in form and color, but with the opinions and sentiments with reference to forms and colors, which chance to prevail at a particular time, in a particular country, or social class. Conventionality in art holds the same relation to the beautiful that conventionality in morals does to the good, or in speculative opinion to the true.

CONVENTION PARLIAMENT. It is a branch of the royal prerogative, that no parliament shall be convened by its own authority, or by any other authority than that of the sovereign. Where the crown is in abeyance, this prerogative cannot of course be exercised, and the expedient of convention parliaments has been resorted to, the enactments of which shall afterwards be ratified by a parliament summoned in accordance with the provisions of the constitution. The C. P. which restored Charles II. to the throne met above a month before his return, and was afterwards declared to be a good parliament, notwithstanding the defect of the king's writs (13 Car. II. c. 7 and c. 14). In like manner, at the revolution of 1688, the lords and commons, on the summons of the prince of Orange, met in convention, and disposed of the crown and kingdom, and this convention was subsequently declared (1 Will. and Mary, st. 1, c. 1) to be really the two houses of parliament, notwithstanding the want of writs and other defects of form. Under the name of CONVENTION, there also took place a meeting of the estates of Scotland, called by the prince of Orange on the same occasion. This meeting commenced on the 14th of Mar., 1689, and was turned into a parliament on the 5th of June thereafter. The principal act of the convention was to settle the Scottish crown upon William and Mary.

CONVENTIONS, NATIONAL POLITICAL. The constitution of the U. S. provides for the appointment of electors by each state, according to the ratio of apportionment in congress; the design of the framers having been to place in the hands of this body the power of selecting suitable men for the offices of pres. and vice-pres. About 50 years ago, the first so-called national convention was held; and since that time the electors of either party have become mere automatons, echoing the will of the C., instead of following the intention of the constitution in the exercise of a choice pledged to no man, and responsible to no political cabal. The C., which is a usurpation, finding no support from either the constitution or the laws, is regulated as follows: delegates are appointed by primary assemblies in the different cities, towns, etc., who meet in a certain place in a given district at a fixed time, and there nominate and ballot upon various men, one of whom is finally elected. The majority of the delegates thus chosen come to the C. pledged to support a favorite candidate, and many state delegations positively annul the will of the minority by the use of the "unit rule"—a device by means of which the entire vote is cast according to the wishes of the majority. The result of the C. system is that no deliberate choice can be made and the different factions are frequently forced to unite on a "dark horse" or an unexpected candidate who, being a compromise, generally fails to represent the best judgment of the party and of the country. Unworthy considerations concerning the availability of candidates are developed by the C. system; and it is well known that the sessions of these bodies are attended by the worst elements of the political parties, and frequently characterized by flagrant corruption. The elector designed by the constitution is an officer holding a dignified position of grave responsibility; and it was not foreseen that the nominations of political parties would reduce his function to the mere registration of the popular vote, which on its part, is practically reduced to a choice between perhaps two candidates who may at any given time represent chiefly the antagonistic adjustments proposed by political bargaining.

CONVERGING, or **CONVERGENT,** is applied, in geometry, to straight lines that meet or tend to meet in a point; looked at in a direction from the point, they are *divergent*, or separating. C. and divergent are often used in reference to rays of light. See CATOPTRICS. In algebra, the term convergent is applied, in a loose way, to any infinite series the terms of which go on diminishing; while a series is called divergent when its terms continually increase. Strictly, however, a C. series is one whose terms diminish in such a way that no number of them added together will be as great as a certain given number. Thus, however far we extend the series, $1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$, etc., the sum will never amount to 2, though always approaching nearer to it. But the series, $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+$ etc., has no such limit, and is therefore not convergent in this sense.

CONVERSAZIONE (Italian). A gathering for social purposes and conversation, where amateurs and others may meet for interchange of ideas on literature, art, or science.

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CONVERSE AND **CONVERSION** are terms in logic, signifying that one proposition is formed from another by interchanging the subject and predicate: as, "Every A is B;" the C. of which is, "Every B is A." This example is termed a case of *simple* conversion; besides which, however, logicians recognize two other kinds of conversion—viz., *limited* conversion, and conversion by *contraposition*. The former may be exemplified thus: "Every A is B;" the limited C. of which is, "*Some* Bs are As;" and the latter thus: "Some A is not B;" which, converted by contraposition, is, "Something that is not B is A;" "Some men are not wise; some beings that are not wise are men." Of these logical converses, the second and third are *necessarily* true, but not the first. When we say, "Every A is B," the reader might at first sight conclude that "Every B is A" also; but if, instead of these letters, to which he probably attaches no meaning, he employ terms denoting objects with which he is familiar, he will see that a simple C. may be very far from the truth. Thus, "Every penny is a coin," has for its simple C. "Every coin is a penny." The reason why a simple C. is not necessarily true is, that in such a proposition as "Every A is B," the subject "A" is—to speak logically—universally distributed, whereas the predicate "B" is not. If it were, the proposition would read as follows: "Every A is *every* B;" the simple C. of which, "Every B is every A," would be true.

CONVERSION, in law, an unauthorized assumption and exercise of the rights of ownership over goods or personal chattels belonging to another, to the alteration of their condition or the exclusion of the owner's rights. Direct conversion is when the person actually appropriates the property of another to his own use, or destroys it, or alters its nature. Constructive conversion is when a person does such acts in reference to the goods, or personal chattels of another as amount, in view of the law, to appropriation of the property to himself. In equity, conversion is the exchange of one species of property for another, which, in the consideration of the law, takes place under some circumstances, although no such change has actually taken place. Land is held to be converted into money, in equity, when the owner has contracted to sell; and if he die before making a conveyance, his executors, and not his heirs, will be entitled to the money.

CONVERTER, in metallurgy, a receptacle holding iron which is to be converted into steel; a spherical vessel, lined with fire-clay, the bottom having numerous holes through which a powerful blast is driven during the process. From this vessel the liquid steel is poured into molds.

CONVEX. See CONCAVE.

CONVEY'ANCING is the art of preparing the deeds or instruments used for the transference of property from one person to another. Such writings form the title or evidence of the right of the person possessing or claiming possession of property; and it is of the greatest importance that the conveyancer employed to prepare them, should be possessed of a competent knowledge of the law as applicable to such deeds, and have the skill required to frame them in such a form as clearly to express and attain the object intended. In the earliest stage of society, there was no call for the profession of a conveyancer; property was held in right of occupancy, without any written title, and was also conveyed from one to another without writing, the new owner being usually put in possession in presence of witnesses called for the purpose, by some symbolical form, such as the delivery of earth and stone to represent the land, a wand to represent wood, grass and corn to represent tithes, and other appropriate symbols to represent mills, fishings, or other kinds of property.

In the earlier period of the history of the Jews, the symbolical mode of changing the ownership of property was curious. "Now this was the manner *in former time* in Israel concerning redeeming and concerning changing, for to confirm all things: a man plucked off his shoe, and gave it to his neighbor: and this was a testimony in Israel" (Ruth iv. 7). In later times, the Jews appear to have had a much more artistic system of C., making use of all the safeguards that are used in modern times—viz., writing, witnesses, subscribing, sealing, and recording the documents. There is a very distinct account of a Jewish conveyance in the later period in Jeremiah xxxii. 9–12. "And I bought the field of Hanameel, and weighed him the money. And I subscribed the evidence, and sealed it, and took witnesses. So I took the evidence of the purchase, both that which was sealed according to the law and custom, and that which was open: and I gave the evidence of the purchase unto Baruch, in the sight of Hanameel [the seller], and in the presence of the witnesses that subscribed the book of the purchase, before all the Jews that sat in the court of the prison."

The Romans made no distinction in principle between real and personal or movable and immovable property, in their conveyancing. Each kind of property was held free of any superior. Their deeds were therefore simple, not requiring any reservation or declaration of the superior's rights. They had public registers in which conveyances were recorded. After the invasion of the southern by the northern nations, the feudal system spread over nearly the whole of Europe, and C. was regulated in accordance with it; the rights of the superior and the rights of the vassal or proprietor being carefully distinguished. The leges barbarorum, contained in the Burgundian code, and the code of the Longobardi, embody the older feudal uses, from which the modern are derived. In the 7th c., a work of peculiar interest to the conveyancer was compiled by

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Marculfus, a monk, containing the germs of modern conveyancing. It is in substance a book of styles or forms of deeds, partly Roman and partly feudal. The genius of the system of land-rights derived from the barbarians was to concentrate the property of land, for the sake of individual power; while the Roman laws and customs tended in the opposite direction, for they treated land in regard to succession like movables, as the French now do, dividing it among the whole members of a family. Alienation by sale or gift was freely permitted, a power long denied by the feudal rules. Indeed, feus or grants were originally revocable by the superior, and did not become hereditary till the time of Charlemagne.

Among the ancient Goths and Swedes, the conveyance of land was made in the presence of witnesses, who extended the cloak of the buyer, while the seller threw a clod of the land into it, as a symbol of the transference of possession. Among the Saxons, the delivery of a turf by the seller to the buyer was necessary. Written titles were, however, introduced at an early period, and at first were short and simple in form, but increased in length and complexity as civilization advanced, containing various conditions, provisions, and limitations, so that the art of the conveyancer became both a difficult and laborious one. He had not only to prepare the appropriate form of conveyance, but to examine the prior writings forming the title to the property, in order to judge whether they were in proper form and valid. As a general rule, a written title is now essential to the possession of real property in civilized communities; and if there is no written title, the property falls to the crown or state. In the Roman empire, extending over the greater part of Europe, the system of land-rights was allodial —that is, the lands were held independent of any superior. After the irruption of the northern nations into Italy, the feudal system was introduced, by which the proprietor has only a limited right under a superior. The introduction of the feudal system tended to complicate written titles to land very much, as not only had the rights of the grantee or vassal to be expressed and defined, but those of the granter as over lord or superior, also In the present century, again, the tendency is towards simplicity; and in France, the feudal system has been superseded by the code Napoleon. In Great Britain and other countries still retaining the feudal system, the forms of C. have been much shortened and simplified.

The complexity, uncertainty, and expense of the old method of conveyancing, originating in feudal conditions of ownership of land, and framed originally, not to accelerate, but to make difficult the transfer of land, have long called for radical reform. In England, in the United States, and in Canada, Land Transfer Reform Associations exist, and are vigorously pushing for legislation in this direction; something has already been achieved, but much remains to be done. Few even of professional conveyancers would deny the truth of the statement made not long ago by the Duke of Marlborough in the *Fortnightly Review*, that heretofore "in every country the theory of the land laws has depended on the fact that land was never intended to be dealt with by free commerce and barter, and its sale and exchange have at all times been surrounded with legal difficulties of every description." As property is subdivided into smaller and smaller portions, and as the number of conveyances which make up the chain of title to a piece of real estate continually increases, the difficulty and cost of establishing a clear title becomes continually more and more burdensome. An illustration of this is given by a New York newspaper, which points out that when the famous Jumel estate in New York was disposed of, it was divided into 1383 pieces and sold to over 800 buyers; each of these had to engage a lawyer to carefully search through every old deed, mortgage, and record relating to the entire property, picking them out from 3500 volumes of deeds and mortgages in the office of the New York Registrar; here it is clear that 299 out of 300 parts of the total labor and expense were wasted. The same writer asserts that in New York city the amount thus expended is over one per cent. of the total value of the property transferred, and that at least half of this is unnecessary waste. So great has the task of searching and verifying titles become in New York city that Land Title Guarantee companies have been formed, which insure purchasers and mortgagees against flaws in titles; the companies make a business of searching records, and sometimes have elaborate analyses and abstracts of real estate records, costing them many scores of thousands of dollars. In the United States the system of conveyancing generally adopted is that by deeds of BARGAIN and SALE (which see); many states have simplified the old method and several prescribe an exact form of deed, defining the legal effect of the specific words of conveyancing, limiting, conditioning, and so on. It follows that the laws of the states are not uniform, but the essentials of a conveyance by deed are practically the same, requiring that it be in writing, be signed and sealed by the grantors, be acknowledged before a notary or other officer authorized by statute, be actually delivered and, finally, be recorded in the public office of registration. The direction which all present agitation for reform in conveyancing is taking is that pointed out by the success of the Torrens System of Australia. The main principle in that system is the registration of *titles* as distinguished from the registration of deeds. It was introduced first in South Australia about thirty years ago by Mr., now Sir Robert, Torrens, was eminently successful practically, and has since been adopted by the other Australian colonies. Under it the ownership passes only on the filing, in the proper registry office, of the title; thus the actual transfer and the public notice of it are simultaneous, and

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the records of the office cannot be impeached by flaws in the conveyance itself, nor can a purchaser be deceived by the existence of a deed not recorded and of which he could have no knowledge. The system of registration is a very simple one; a special folio of the record is devoted to a single piece of land, and there in one place and together are recorded every transfer and transaction affecting the title of that piece of land or forming a charge on it, and, we repeat, the title to that land can shift only upon the registration itself. The Government holds to the land-owner under this system much the same relation that a corporation issuing certificates of registered stock holds to the purchaser thereof—that is, the transfer of such stock certificates is made on the books of the company and takes effect only upon new entry therein. Under the Torrens System a "Master of Titles" is intrusted with the duty of seeing that the transfer is regular and is properly executed. A guarantee fund is established by the State to compensate any persons injured by errors of any kind. But the percentage of claims made from the guarantee fund to the value of the property involved has been very small—less, it is said, than the one hundredth part of one per cent. The great merit of this system is that, once established, it makes title certain and absolute, and obviates research in ancient conveyances. No doubt there is expense and difficulty in changing from the old to the new system of conveyancing, but the results attained are great. In Canada the system has been tried—though in a limited and imperfect form—in Toronto, and there is a strong agitation for its universal adoption under a compulsory law. In England a Land Transfer Reform bill was introduced in 1875 by Lord Cairns, and passed, but in a mutilated and altogether unsatisfactory form; in 1882 a second act was passed simplifying the art of conveyancing and leading the way towards a general reform; in 1889 Lord Salisbury's government introduced a bill making the Torrens System compulsory, which was defeated only after its third reading and by a very small majority. It seems probable that such a reform will pass before many years. In the State of New York an act has been passed, taking effect in January, 1891, which provides for a reformed or block scheme of indexing conveyances to supplant the old system of consecutive registration of deeds indexed only by the names of the parties thereto. This is also a step in the direction of the Torrens System of registration and transfer by titles.

CONVICT, a person found guilty after due trial of a criminal offense; in general usage the term is applied only to persons convicted of felonies or crimes of a serious kind, not to those found guilty of local breaches of order or misdemeanors. The term *Convict System* denotes that system by which a state punishes or disposes of its convicts, and is used more especially of systems of penal transportation like that of Russia, which exiles its criminals to Siberia, and that by which England formerly established convict colonies in Australia. The last-named system came to an end in 1840, owing to the fact that the Australian colonies very naturally declined to be longer used for that purpose; grave doubts had also arisen as to the efficacy and desirability of the system itself. The present method of Great Britain in dealing with convicts divides their punishment into two stages, the first one of separate confinement, the second one of hard labor. In the United States, solitary confinement is looked upon with great disfavor, and is generally now disused in the State penal institutions. The theory of specialists on prison reform at this day holds that not alone the infliction of punishment and the enforcing of an example on others through fear are to be considered, but that a main object should be the reformation of the prisoner and his final restoration to society as a useful and honorable member. To this end the allotment of suitable labor, the teaching of a useful trade, the flexibility of the term of imprisonment according to good conduct and evidence of reform, and the general use of reformatory as distinguished from merely penal methods —all are regarded as essential. In some of the southern states there exists a convict-lease system under which the state convicts are leased to contractors to be employed in gangs outside the prison on public works or other out-door labor; in this chain-gang system the authority of the state is really handed over to the contractor, who is held responsible for the security of the convicts under heavy bonds to the state. The obvious abuses to which this system is liable have led to a general movement among reformers and philanthropists for its abolition, which it is to be hoped will not long be delayed. A quite different contract convict-labor system is in use in some states where the labor of the prisoners, carried on inside the prison, is sold to a contractor for a given time. This system also is open to objection—though it is free from the cruelty and gross abuses of the chain-gang system—and in some states, New York, for instance, it has recently been abolished by law. Some opposition has been made by trades'-unions and other labor associations to the selling in the public market of the products of convict labor as introducing an unfair element of competition in the labor market. Recent legislation has in some instances been shaped to meet this sentiment, but the proportion of convict to free labor is so small that it cannot justly be said to constitute an important factor in the industrial question.

In 1890, the census reports showed that there were in the various penitentiaries of the United States, 45,233 convicts, of whom 12,842 were born of native parents; 6584 of foreign parents; 7267 were foreign born; 30,546 were white and 14,687 colored. As regards sex, 43,442 convicts were men, and 1791 were women. See PRISONS.

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CONVOCATION at Oxford University is a body consisting of all persons who have taken the degree of Master of Arts, or Doctor of Civil Law, or Doctor of Medicine. It is the body which finally accepts or rejects all statutes of the University after they have passed the other two governing bodies—the Hebdomadal Council and the Congregation of the University. Practically, the powers of Convocation are generally exercised by the Vice-Chancellor and the Proctors, assisted by certain stated committees. The name is used in the state of New York of the annual meeting of the body known as the Regents of the University, held annually at Albany in the month of July, and attended by all professors and instructors in the higher institutes of learning in the state, all of whom are *ex officio* members of Convocation. See REGENT; UNIVERSITY.

CONVOCA'TIONS (from Lat. *convocare*, to call together) were originally synods of the clergy or the ancient ecclesiastical councils of the archbishop, but became incorporated into the English constitution of church and state, and endued with certain parliamentary privileges. Some writers distinguish between councils and C.—the former as being for spiritual purposes, and summoned without authority from the crown; the latter as being for civil purposes, and by command of the crown. The two, however, in process of time, especially after the conquest, became gradually blended; C. made canons, and councils granted subsidies, and all distinction had disappeared before the reformation. The circumstances attending the famous assembly at Northampton, 1282, in the reign of Edward I., helped to settle the form which C. have since assumed. In England, the provinces of Canterbury and York have each their convocation. Previous to the reformation, these were sometimes convened into a *national* synod; but since then, matters have usually been concluded in the C. of Canterbury, and transmitted to York for concurrence. A convocation consists of three elements—1. The archbishop; 2. The bishops; 3. The clergy of the second order. They originally met in one assembly, but since the beginning of the 14th c. the clergy in the province of Canterbury have retired into a distinct chamber, presided over by a *prolocutor*, with officers and journals of their own. These two bodies are called the upper and lower houses. In the convocation of York the same distinction exists, but on the rare occasions of their meeting, the business has been generally conducted in one assembly. The archbishop has the sole power of summoning, presiding, and proroguing; he has also a veto upon all measures. He cannot, however, summon without authority from the crown. The upper house is the proper *locus synodi*, where the bishops have a right to sit and vote, and before the reformation the mitred abbots had place there also. The lower house consists of the lesser dignitaries, as deans and archdeacons, and the proctors sent by capitular bodies and by the parochial clergy. In Canterbury, the beneficed clergy only elect, and they send one proctor for each diocese; in York, all the clergy elect, and send one proctor for each archdeaconry. The lower house deliberates on matters proposed to the archbishop; it may present petitions to the upper house and state grievances, be with it in judicature on persons convened, and dissent from and so hinder the passing of any synodical act. The passing of subsidies in convocation ceased in 1665, and the records were destroyed in the fire of London in the following year. Meetings of convocation fell into abeyance from the political troubles caused by the revolution of 1688. They have been revived with considerable advantage to the church, but their action has been and is greatly restricted. In Ireland, the C. of the four provinces assembled at Dublin, all together, and were on the model of those in England. At the union, no provision was made with respect to this matter, and since then there has not been even a formal assembling of the Irish convocation. An act of parliament was passed in 1663, for regulating the meetings of convocation in Scotland; but shortly after the revolution of 1688, the Episcopal church ceased to be the national church of that country; and ever since, the meetings of the Presbyterian church, embracing clergy and laity, have been called general assemblies. See ASSEMBLY, SYNOD.

The position of the church of England as respects its C. is exceedingly anomalous, but is incidental to certain circumstances in the constitution and polity of the country. As essentially interwoven with the state, the church possesses no independent action; its articles, liturgy, organization as to benefices, etc., are all regulated by parliament; while its discipline falls within the scope of the ecclesiastical courts, a class of tribunals apart from the ministering clergy. The church, therefore, in its capacity as an institution to teach certain doctrines of religion, is left little to do in the way of jurisdiction. It is further urged, as a reason for restricting the power of convocation, that being purely sacerdotal, it might be apt to run into excesses, and put forth claims adverse to the prevailing tone of sentiment on religious matters; that, in short, as things stand, it is safer for the public to be under the authority of parliament than to be subject to the ordinances of a body of ecclesiastics. At the same time, it is generally allowed that some kind of reform is desirable, though how this should be effected in a manner satisfactory to all parties, it would be difficult to say. The convocations of Canterbury and York assemble annually at the opening of parliament, each keeping up its own distinctive customs. See Trevor's *Convocations of the Two Provinces;* Cardwell's *Synodalia*, and *Documentary Annals;* Lathbury's *History of the Convocation of the Church of England.*

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CONVOL'VULUS (Lat. *convolvo*, to twine together), a genus of plants, the type of the exogenous natural order CONVOLVULACEÆ. This order contains nearly 700 known species, herbaceous and shrubby; generally with a twining stem and milky juice; large and beautiful flowers; a 5-partite calyx; a monopetalous corolla, with regular 5-lobed and plaited limb; five stamens; the ovary free, with 1 to 4 cells and few ovules; the fruit a capsule, sometimes succulent. The plants of this order are very abundant in the tropics, but comparatively rare in cold climates. Many are cultivated as ornamental plants, particularly species of *convolvulus* and *ipomœa*. The acrid milky juice is often strongly purgative; and jalap and scammony are products of this order. Some species, however, have large farinaceous roots, capable of being used as food, of which the batatas (q.v.), or sweet potato, is the most important. Two have been introduced into eastern America and are called BINDWEED. *C. arvensis* is a troublesome weed in some sandy soils near the coast, and *calystegia sepium* in richer soils. The former has rose-colored fragrant flowers, the latter large white flowers. Both are ornamental; the latter is now often planted to cover posts and trellises. *C. scammonia* yields scammony, and the root of *C. panduratus* is used as a purgative in the United States. *C. scoparius*, a shrubby species, native of the Canary isles, yields one of the kinds of wood called rosewood, which has a strong smell of roses.

CONVOY (Fr. *convoi*) is the name given to one or more ships of war appointed to protect a fleet of merchant vessels against the attacks of an enemy or of pirates. If a merchant ship part company with the C., or neglect to obey the signals, all claims of insurance are forfeited. The name is sometimes applied to the merchant vessels so escorted. In the military service, a C. is, properly speaking, a train of wagons laden with provisions or warlike stores; the term, however, is applied also to the detachment of troops, or escort, appointed to protect such a train.

CONVUL'SIONARIES, the name given to a fanatical sect of Jansenists who sprang up in France about 1730. Their meeting-place was the church-yard of St. Medardus, in a suburb of Paris, where was the tomb of a certain Francis of Paris, who died in 1727, and was reckoned very holy by the Jansenists on account of his extravagant asceticism. At this tomb a multitude of people poured forth fanatical prayers, preachments, and prophesyings. Miracles are also alleged to have been performed, for proof of which we are referred to a work written by M. Montgeron, a French senator, and entitled *La Verité des Miracles opérés par l'intercession de François de Paris* (Paris, 1737). After 1731, the fanaticism of the C. increased to utter madness. "They threw themselves into the most violent contortions of body, rolled about on the ground, imitated birds, beasts, and fishes, and at last, when they had completely spent themselves, went off in a swoon." In 1733, the king issued an order for the imprisonment of these fanatics, but it was found impossible to put a complete stop to the mischief. They took to predicting the downfall of the throne and the church, which prophecy the French revolution appeared to fulfill. They were not much heard of in Paris after the middle of last century, but have occurred in country-places at various times within the present century. They brought Jansenism into so much disrepute, that Voltaire declared the tomb of Francis to be the grave of Jansenism.

CONVULSIONS, a form of disease very frequently affecting infancy, in which the body is thrown into violent spasmodic contractions, the sensibility and voluntary motion being for a time suspended. A fit of C. may last from a few minutes to some hours, and may readily prove fatal, if not relieved within a short period. The first symptom observed is often a twitching of particular muscles or groups of muscles, and a change in the habitual expression or color of the face, with distension of the features, and turning of the globes of the eyes suddenly upwards. The fingers are sometimes clenched in the palm, and the feet turned inwards; sometimes, however, C. occur absolutely without warnings of this kind, and even in the midst of perfect apparent health. Their cause is usually to be found in some source of irritation, capable of producing fever if long continued; as, for instance, disordered dentition, worms in the intestine, hooping cough, etc. Most epidemic fevers are also apt to be attended, in children, by C. in their early stages; and diseases of the brain and its membranes at every stage of their progress. C. are greatly promoted by bad ventilation and injudicious feeding, with deficient exercise; and a great part of the cure consists in discovering and removing the causes of the disease.

When a child is suddenly seized with C., or with a tendency to spasm, such as twitching of the features, or contractions of the fingers and toes, it should be placed at once in a very free current of air, with its feet towards the fire; the extremities should be kept warm, and a cold lotion may be applied to the head, especially if there is much flushing of the face; a little castor oil may be given if the bowels are confined; and if there is flatulence, the belly may be rubbed with a warm hand, or with some simple stimulating liniment, such as camphorated oil. Not much more can be done without medical assistance; but in the event of the case being very serious, and medical aid at a great distance, it might perhaps be right to cause the child to inhale a little chloroform, great care being taken that plenty of air is also admitted to the lungs. The strictly medical treatment commonly consists in the administration of medicines

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adapted to the state of the bowels, with the application of cold to the head, and sometimes the inhalation of chloroform. Leeches and bleeding are very rarely useful, though too often employed.

C. are rare amongst horses and cattle. In young dogs, however, they frequently occur from intestinal worms, disordered digestion, or in connection with distemper or other debilitating diseases: they usually disappear when the causes are removed.

CONWAY, a river in North Wales, 30 m. long—one of the most noted in Wales for the bold romantic scenery along its higher, as well as the rich beautiful scenery along its lower course. It rises in a small mountain lake where the three counties, Merioneth, Denbigh, and Caernarvon meet, and runs n.w., n.e., and n., past Llanrwst, Trefrhiw, and Conway, to Beaumaris bay in the Irish sea. It receives many rapid mountain streams. In the lower 12 m. of its course it is a large, winding, smooth stream, up which the tide flows, and is navigable for vessels of 100 tons. At Conway it is half a mile broad at spring-tides, which rise here 21 to 24 feet. The C. has been famous for its pearls since Roman times.

CONWAY, a co. in central Arkansas, on the Arkansas river, and intersected by the Little Rock and Fort Smith railroad; 493 sq. m.; pop. '90, 19,459, includ. colored. The surface is diversified and the soil is fertile, producing corn, cotton, tobacco, etc. Co. seat, Morrillton.

CONWAY, a town in Carroll co. N. H., on the Saco river, 71 miles n.e. of Concord, containing the villages of Kearsarge, North Conway, Conway, and Conway Centre; pop. '90, 2331. The village of North Conway is famed for beautiful scenery, and is a popular summer resort. On the e. is a range of hills, and a little to the n. is Mt. Kearsarge, 3,367 ft. above tide. On the w. are other peaks, and up the valley of the river Mt. Washington is in view.

CONWAY, or ABERCONWAY, a seaport t. of Caernarvonshire, North Wales, on the estuary of the Conway, here crossed by a fine tubular, and a suspension bridge, 22 m. n.e. of Caernarvon. The town, which is triangular in form, is beautifully situated on a steep slope on the left bank of the Conway, and is surrounded by walls 12 ft. thick, with towers and battlements. The principal streets are well proportioned and regular, and contain several ancient houses. C. castle, one of the noblest castellated structures in Britain, stands on a precipice overlooking the river. It was first built by Hugh Lupus, earl of Chester, and rebuilt in 1283 by Edward I., to check the Welsh. Its walls are 12 to 15 ft. thick, with eight vast towers, four of which are each surmounted by a slender turret. In 1646, the parliamentary forces took the castle, but did not injure it; but after the restoration it was dismantled by the earl of Conway. The Plâs Mawr, "Great Mansion," is a noble pile erected in 1585, in the Elizabethan style, with the exterior and interior profusely ornamented with figures, coats of arms, scrolls, etc. The harbor is dry at low-water. C. was an opulent town until the great plague in 1607 almost depopulated it. A Cistercian abbey was founded here by Llywelyn ab Jorwerth, prince of North Wales. Llywelyn the great, and several other princes and illustrious persons, were buried in it. The castle hotel at present occupies its site. Pop. '91, 3467. C. unites with Caernarvon, Bangor, Criccieth, Nevin, and Pwllheli in sending a member to parliament. See illus., BRIDGES, vol. III.

CONWAY, HUGH. See FARGUS, FREDERICK.

CONWAY, MONCURE DANIEL, b. Vt., 1832; graduated at Dickinson college, 1849; began to study law but gave it up and joined the Methodist ministry. He preached in various towns in Maryland, and wrote for a Richmond paper, being then a cordial supporter of extreme southern opinions. His views, however, experienced a change; he left the Methodist church, and entered the divinity school at Cambridge, where he graduated in 1854. Returning to Virginia, he was driven from the state on account of his political opinions. He then became pastor of a Unitarian church in Washington. From this he was dismissed because of his opinions on slavery, and he went to Cincinnati. He lectured in Ohio and in the New England states on the slavery question. In 1863, he visited England, where he lectured and wrote on the war and its effect on slavery. For several years thereafter he labored as minister of the South Place Ethical Society in London, but resigned in 1897. Among Conway's publications are *Tracts for To-day; The Rejected Stone; The Golden Hour; The Earthward Pilgrimage; Republican Superstitions; The Life of Thomas Paine* (1892); *The Writings of Thomas Paine* (1895), etc.

CONWAY, THOMAS, 1733–1800; an officer in the American revolution, a native of Ireland, educated in France, and came to America in 1777. He was appointed brig.-gen., and took part in the battles of Brandywine and Germantown. Against the protest of Washington, Conway was made inspector-general, in which position he was prominent in the intrigue by which Gates was to be put in Washington's place. In 1778, he resigned, and in the same year he fought a duel with Gen. Cadwallader. In 1784, he returned to France, and was appointed governor of Pondicherry and the French East India settlements. When the French revolution came, he was compelled to fly and his life was saved only by the interposition of English authority.

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CONY, an old English name for the rabbit, but employed in the authorized and other versions of the Bible as the translation of a Hebrew word which certainly does not designate the rabbit. The C. of the Old Testament is with the greatest probability supposed to be the daman (q.v.) or ashkoko.

CON'YBEARE, JOHN, 1692–1755; an English divine, a graduate of Oxford, ordained in 1716. He subsequently became a tutor in the college and was appointed one of the preachers to the king at Whitehall. In 1730, he was chosen master of Exeter college. He had previously attracted notice by the publication of two sermons on *Miracles*, and on the *Mysteries of the Christian Religion;* and in 1732, he published his great work, *A Defense of Revealed Religion*, a reply to Matthew Tindale's *Christianity as Old as the Creation*, which appeared two years before. Conybeare was appointed dean of Christ church, Oxford, and finally bishop of Bristol.

CON'YBEARE, JOHN JOSIAS. 1779–1824; grandson of the bishop of Bristol; professor of the Anglo-Saxon language and of poetry in the university of Oxford. He made valuable contributions to the annals of philosophy and science, and published *Illustrations of Anglo-Saxon Poetry*.

CON'YBEARE, WILLIAM DANIEL, 1787–1857. He was educated at Oxford, and was one of the earliest and most efficient members of the geological society. In 1821, he discovered and described the first plesiosaurus, thereby opening the road in which important discoveries were afterwards made by Owen and others. He was made dean of Llandaff, and was a fellow of the royal society. In 1836, he published a course of theological lectures. His principal work was *Outlines of the Geology of England and Wales*.

CON'YBEARE, WILLIAM JOHN, 1815–57; son of William Daniel, and an English clergyman and writer of essays. He wrote *Perversion, or the Causes and Consequences of Infidelity* (a religious novel), and with Rev. J. S. Howson wrote the *Life and Epistles of St. Paul*. His essays and sermons were collected and published.

CONY'ZA, a genus of plants of the natural order *compositæ*, sub-order *corymbiferæ*, of which one species, *C. squarrosa* (also known as *inula conyza*), is of frequent occurrence in England and throughout great part of Europe. It has a stem 2 or 3 ft. high, downy ovato-lanceolate leaves, and yellow flowers. It receives the English names fleabane and plowman's spikenard, and has a strong peculiar smell, which is said to drive away fleas and gnats. In most of the languages of Europe, it bears names referring to this property.

COOK, a co. in n.e. Illinois, bordering on Indiana and lake Michigan, intersected by the Illinois and Michigan canal, and by the numerous railroads centring at Chicago; 960 sq.m.; pop. '90, 1,191,922. The surface is level and the soil rich, producing wheat, corn, oats, barley, potatoes, hay, wool, and vast quantities of milk and butter for the Chicago local market. Co. seat, Chicago.

COOK, a co. forming the n. eastern extremity of Minnesota, between lake Superior and Pigeon river; pop. '90, 98. Co. seat, Grand Marais. Area, 1520 sq.m.

COOK, CHARLES, D.D., 1787–1858; an English clergyman, appointed in 1818 to the French mission of the Methodist church in Normandy. It was mainly by his exertions that Methodism was established in France.

COOK, CLARENCE CHATHAM, b. Mass., 1828; graduate of Harvard. He studied architecture, and passed several years in teaching. In 1863, he wrote for the *N. Y. Tribune* a series of articles on American art, and in 1869 was its correspondent in Europe. He has made a specialty of art criticism. He has published *The Central Park; The House Beautiful;* edited Lübke's *History of Art* (new trans.); became, 1884, editor of *The Studio*.

COOK, ELIZA, b. 1817; an English writer of poetry and essays. Her first book was *Melaia, and Other Poems*. In 1849, she became editor of *Eliza Cook's Journal*, a weekly publication intended to inform and elevate the people. In 1864, she published *New Echoes;* and was the author of several other works. She d. 1889.

COOK, Captain JAMES, one of the most eminent among England's celebrated navigators, was b. Oct. 27, 1728, at Marton, in Yorkshire, where his father was an agricultural laborer. At first apprenticed to a haberdasher, he afterwards went to sea, and, having spent some years in coasting-vessels, entered the royal navy, in which he soon rose to the rank of master. The charts and observations which he drew up as marine-surveyor of the coasts of Newfoundland and Labrador, introduced him to the notice of the royal society, who offered him the command of an expedition to the Pacific ocean, to make an observation of the transit of Venus over the face of the sun. The voyage being one to his taste, C. immediately accepted the offer, and set sail from Plymouth on the 26th of Aug., 1768, in the *Endeavor*, a small ship of 370 tons. The expedition arrived at Tahiti (or Otaheite, as he named it) on the 13th April of the following year; and the transit was witnessed in a most satisfactory manner on the 3d June. Leaving Tahiti on the 13th July, C. visited New Zealand, which had not been touched at by Europeans for

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a century and a quarter; and after exploring the coast for six months, sailed westward, reaching (on the 19th April, 1770) New Holland, now Australia, which he called New South Wales, and took possession of in the name of Great Britain. Having explored a large portion of the coast, he steered for New Guinea, passing between Australia and that island, and thus proving, what had heretofore been doubted, that the two were distinct islands. Continuing his voyage by Java, Batavia, and the cape of Good Hope, C. anchored in the Downs on 12th June, 1771. This voyage, besides vastly increasing geographical knowledge—one of the important results in this respect being, that it proved that neither Australia nor New Zealand belonged to the southern continent at this time supposed to exist, and that to the northward of lat. 40° s. no continent could exist—also added not a little to the sciences of botany and astronomy. A second voyage, for the discovery of what was then called the *Terra Australis Incognita*, which was now believed to lie in higher latitudes than had hitherto been explored, was undertaken by C. in the year of his return; and the expedition, consisting of two ships—the *Resolution* and the *Adventure*—sailed from Plymouth on the 13th July, 1772. It would be out of the scope of this article to follow Capt. C. through his three years' navigation of the Pacific and Southern oceans, in the course of which time he sailed upwards of 20,000 leagues. It can only be stated generally, that his voyage proved the non-existence of land of any extent between the 50th and 70th parallels. C. arrived in England again on the 30th July, 1775. So admirable had been his arrangements for the health of his crew, that during the whole voyage he lost only one man by sickness; and so skillful his seamanship, that not a spar of any consequence was lost. C. wrote an account of his second voyage himself. The belief in a practicable n.w. passage, notwithstanding the failure of attempts extending over two centuries, still held possession of men's minds; and C. had no sooner returned from his second voyage, than he offered his services to the admiralty, who had resolved on another effort for the discovery. They were gladly accepted, and C. determined to seek the passage by the way of Behring's strait, instead of by Baffin's bay and Davis' strait, the routes formerly attempted. In his old ship, the *Resolution*, accompanied by Capt. Clerke in the *Discovery*, C. sailed from Plymouth on the 12th July, 1776. In this last voyage, C. met his death at the hands of savages, on the island of Hawaii, while endeavoring to recover a boat which had been stolen from the *Discovery*. This tragical event occurred on the 14th Feb., 1779; not, however, before C. had made valuable additions to our geographical knowledge of the coasts of America and Asia, in the region of Behring's strait. The news of his death occasioned deep and general regret in England. The king granted his widow a pension of £200, and each of his children £25; while the royal society did honor to his name, by having a gold medal struck in his commemoration. C. was one of England's greatest navigators. A practical and scientific seaman, he was also a sagacious, self-possessed commander, kind although strict to his crew, and marked by indomitable perseverance and ready decision.

COOK, JOSEPH (originally FLAVIUS JOSEPHUS), b. Ticonderoga, N. Y., 1838. He fitted for college at Phillips academy, and entered Yale in 1858. After two years he left college on account of ill health, and in 1863 entered Harvard, graduating in 1865. He studied at Andover theol. sem. three years, and preached in various Congregational churches, but was never ordained. He studied also in Germany, 1871–73, and after traveling in the east, settled in Boston. In 1875 he began his "Boston Monday lectures," which he continued until 1881, when he set out on a two years' journey round the world. In 1883 he resumed his Monday lectures in Boston. He has published volumes of lectures on Biology, Orthodoxy, Transcendentalism, 1877; Conscience, Heredity, Marriage, 1878; Labor, Socialism, 1880; *Christ and Modern Thought*, 1881, etc. His discourses have commanded wide attention, and have been the object of exalted praise and of keen criticism. He deals with profound themes of philosophy and with theology as related to science, in a style of glowing rhetoric and with the utterance of strong convictions. In 1895 he made a lecturing tour of Australia and Japan.

COOK, PHILIP, b. Ga., 1817; was in the state senate, 1859–63; brig.-gen. in the confederate army; was elected as democrat to the XXXIXth congress, but not allowed to take his seat; was elected to the XLIIId and four succeeding congresses.

COOK, THOMAS, railway excursion and tourist pioneer, was born at Melbourne, Derbyshire, England, November 22, 1808. His educational advantages were few, and his early days were spent in gardening pursuits, and then in wood-turning and cabinet work. In his twentieth year he became a village missionary, and while thus occupied his sympathies were actively enlisted in the cause of temperance and free trade. But from 1841 his time and toil were engaged chiefly in the initiation and promotion of railway excursions. His first trip was from Leicester to Loughborough in 1841, his aim being the furtherance of the temperance cause. The Midland Railway was for some years the centre of his operations, and the town of Leicester his home. In spite of the great difficulties that had to be encountered, the business grew until not only in Great Britain, but throughout the world, agencies have been established, and the tourist tickets of Thomas Cook & Son are found everywhere. In connection with the late wars in Egypt and the Soudan, the English and Egyptian governments were largely aided by their enterprise; and the firm undertake on behalf of the Indian government the conveyance of Mohammedan pilgrims from India to Mecca. He died in 1892.

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COOK, ZEBEDEE, 1786-1858; b. Mass., one of the earliest in introducing to this country the system of mutual insurance, and president of the first company in New York in that business. He was also interested in agricultural pursuits, and was one of the founders of the horticultural society of Massachusetts. He was also instrumental in founding the beautiful cemetery of Mt. Auburn, near Boston.

COOKE, a co. in n. Texas bordering on the Indian territory, drained by the tributaries of Trinity river; 920 sq. m.; pop. '90, 24,696, includes colored. Its surface is prairie and forest, with rich bottom-lands along the streams. Chief productions, corn, oats, cotton, and butter. Co. seat, Gainesville.

COOKE, EDWARD, D.D., b. 1812; a native of New Hampshire, and graduate of Middletown college; teacher of natural sciences in Amenia seminary, N. Y., and principal of a seminary in Pennington, N. J. He was minister in several Methodist churches in Boston, and was for a time the principal of Lawrence university, Appleton, Wis.; pres. Wesleyan acad., Wilbraham, Mass.; pres. of Claflin univ., S. C., 1874–84. He d. in 1888.

COOKE, GEORGE FREDERICK, 1756–1812; an English tragedian, and one of the first of high rank to visit the United States, appearing at the Park theatre, New York, in 1810, as "Richard III." He played in all the large cities, but his social habits often interfered with his business, and hastened his death. He was buried in St. Paul's churchyard, New York, and his greater successor, Edmund Kean, built a monument over him.

COOKE, JAY, b. Ohio, 1821; for a time one of the leading financiers of the country. He began as clerk in a Philadelphia banking house, where he soon became a partner. About the time the civil war broke out, he was at the head of the house of Jay Cooke & Co., and had more than any other man to do with the negotiation of government loans. The firm suspended in 1873, and subsequently paid its obligations and resumed.

COOKE, JOHN ESTEN, b. 1830, in Virginia, son of John R. He was admitted to the bar, but his attention was devoted almost exclusively to literature in the line of novels and poems. Among his publications are *Leather Stocking and Silk; The Youth of Jefferson; The Virginia Comedians; Ellie, or the Human Comedy; The Last of the Foresters*; *Henry St. John, Gentleman; Life of Stonewall Jackson; Wearing of the Grey;* and other works relating to the war of secession. His later publications are *Doctor Van Dyke*, and *Her Majesty the Queen; Virginia* (historical), etc. He d. 1886.

COOKE, JOHN RODGERS, 1788–1854; a native of Bermuda, and a distinguished jurist in Virginia, where for nearly half a century he held a prominent position. He was a member of the legislature, and of the convention for framing the constitution of the state.

COOKE, PHILIP PENDLETON, 1816–50, poet, son of John Rogers Cooke, was born in Martinsburg, Virginia. He graduated at Princeton in 1834, and studied law with his father, but he cared very little for his profession, taking far more pleasure in literary pursuits. He was also a great lover of field sports, and at the time of his death was considered the best huntsman in the Shenandoah valley. He published many poems, the best-known being "Florence Vane" and "Rosa Lee." The former has been translated into several languages, and also set to music. His only publication in book form was *Froissart Ballads and Other Poems* (1847).

COOKE, PHILIP ST. GEORGE, b. Va. 1809; graduated at West Point Academy in 1827, and served in the army as a dragoon officer. He served through the war of the secession, rising to brevet-brig. gen., and retiring from active service in 1873. In 1856 he published *Scenes and Adventures in the Army*. He d. in 1895.

COOKE, ROSE TERRY (known under her maiden name, Rose Terry), b. Conn. 1827. Her principal writings are *Gold and Silver*, *Happy Dodd*, *Somebody's Neighbors*, *Steadfast*, and two volumes of poems. As a writer of short stories depicting New England life and scenery, she rivals Mrs. Stowe; and *The Thing that Hath Been Shall Be*, and *The Deacon's Week* are good specimens of pathos and humor. She d. in 1892.

COOKERY. To prepare and soften food by the action of fire, and so to render it fit for digestion by the human stomach, has been a general custom from remote times; and more or less of skill in accomplishing this primary end has been displayed, according to the knowledge, wealth, and refinement possessed by each nation or people.

In ancient times, the occasion of a banquet appears chiefly to have arisen in a sacrifice to the gods, when a part of the victim was brought to the dwelling of the sacrificer, and was cooked for the feast. Birthdays, funerals, and victories were also celebrated in this manner. "The Persians," says Herodotus, "were accustomed to honor, above all others, that day on which they were born, when the rich among them would sacrifice an ox, a horse, or a camel, which they roasted whole in ovens, while the poorer class gave only the smaller animals, as sheep. Yet the Persians were not great eaters of meat, but consumed much sweet food, and did not use salt." The appendages to the higher order of banquets were most magnificent, so that in point of quantity and display they were very expensive. Herodotus says on this head, "that the Greeks who invited Xerxes to supper, all came to the extremity of ruin; and that, wherever he took two meals, dining as well as supping, that city was utterly ruined."

The Egyptians, it is said, were great bread-eaters. Though they possessed wheaten flour of the finest sort, they do not appear to have used it for their common bread, which was made of spelt, or of the center of the lotus dried and pounded. Fish they salted

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and dried in the sun ; quails, ducks, and small birds they salted and ate raw. We read of their roasting and boiling the flesh of the ox. Large flocks of geese and of fowls were kept by them for the use of the table, hence their plan for the artificial hatching of eggs. "Fish was used by all classes except the priests, but the staple food of the people consisted of vegetables, of which they had a large supply." Herodotus mentions their making beer from barley, which they called *lythus*. We may still see the form in which their food came to table; ducks, loaves made round, and some biscuits and cakes, which have been taken from Egyptian tombs, are to be found in the British museum. Apollonius, who wrote a treatise on the feasts of the Egyptians, says that they ate in a sitting posture, using the very simplest and most wholesome food.

There appears to have been considerable difference as to the manner in which good eating was appreciated in different parts of Greece. The Athenian meals are ridiculed by the comedians for their parsimony. After the Homeric age of simplicity, in which roast and boiled meat seems to have sufficed the kingly table, a diversity of preparation was obtained in cooking, and a certain epicureanism displayed in the quality, seasoning, and method of dressing food. The names of many authors of C. books are preserved in the writings of Athenæus; that of Archestratus, who is called the guide of Epicurus in his pleasures, and styled the inventor of made dishes, being the most renowned.

Fish was a principal article of food with all classes of Greeks; but with the wealthier, much skill and delicacy were used in cooking it, and choice and expensive sorts were sought after. Archestratus writes of "a boiled torpedo done in oil and wine, and fragrant herbs, and some thin grated cheese." Fish, stuffed with force-meat and fried, boiled in pickle, baked in fig-leaves soaked in oil, cooked in hot ashes, etc., are among the recipes we find recorded. Large quantities of salt-fish were brought from the shores of the Euxine and the Hellespont; and this, with meal, cheese, and onions, was the chief food of the armies and navies when on service. The Greeks boiled and roasted the flesh of sheep, pigs, lambs, and goats. They had poultry, small birds, and game, and sausages made of blood, partaking of the character of black-puddings. The bread made at Athens was the most celebrated; it was sometimes household, but chiefly bought in the market, and was made in great variety, as pan-loaves, rolls, sweet loaves, etc. The bread eaten by the poorer classes was made of barley, and sometimes flavored with oil, honey, poppy-seed, etc. Athenian cheese-cakes were also famous; and they had honey and sesame-cakes, which, with fresh and dried fruits, as figs, almonds, olives, and nuts, seem to have been partaken of after dinner. They consumed vegetable food also in abundance, and had cabbage, onions, lettuce, and so on.

In the Greek house there was no regular cook, though in the establishments of the wealthy several females were kept, to attend to the kitchen. The women, in general, saw to the requirements of the table, and even the lady of the house was not idle. Cooks stood in the market at Athens, ready to be hired for particular occasions; the most celebrated were those of Sicily; they were probably persons of some importance.

> "To roast some beef, to carve a joint with neatness,
> To boil up sauces, and to blow the fire,
> Is anybody's task; he who does this
> Is but a seasoner and broth-maker;
> A cook is quite another thing. His mind
> Must comprehend all facts and circumstances:
> Where is the place, and what the time of supper;
> Who are the guests, and who the entertainer;
> What fish he ought to buy, and where to buy it."
>
> *Quoted by Athenæus from Dionysius, a comic poet.*

In the early days of Rome, a gruel made of barley, and called *puls*, was the principal food of the people, and with green and other vegetables was, till later times, the usual fare of the inferior classes—meat being used but sparingly. By degrees, however, a taste for better eating crept in; and after the Asiatic conquests luxury was imported. Lucullus introduced habits of epicureanism after his return from Asia; the gourmand Apicius earned for himself a deathless name. The wealthy Romans cared for the elegant serving of their table, as well as for the quality of viands placed before them. With them, as with the Greeks, fish was a necessary as well as a luxury: they took much trouble to procure their oysters, and gave large sums for other fish. We read of a mullet of 6 lbs. sold for 8000 sesterces (some $400), and of the rhombus or turbot from Ravenna being held in high estimation. They seem to have been as clever as the French in preparing *surprises*, and in carrying out *disguises* in their dishes. The *pistor*, who made the bread and pastry, and the *structor*, who composed artificial figures of fruit or flesh, and who also arranged the dishes, seem to have shared the duties of the cook. We read of dainties, as ring-doves and fieldfares, hares, capons, ducks, peacocks, pheasants, and the livers of geese; also of such a formidable *pièce de résistance* as a "huge boar, surrounded with sucking pigs made in sweet paste, which were distributed among the guests." The Romans prepared and cooked their food with oil to a great extent. Their meals probably consisted of two courses and a dessert, the first course being of materials intended to sharpen the appetite, and the second the "brunt of war," that is, a joint roasted or baked. The discovery or cultivation of vegetables, perhaps, gave rise to some proper names, as Lentullus, Fabius, etc. It is a Roman saying that the number of persons at a repast should not be less than that of the graces, nor more than that of the muses. The Greeks and Romans used honey for the purposes for which we use sugar.

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The sugar-cane probably was cultivated in China, and its manufacture understood there; but the Greeks took it for a kind of concrete honey, and used it only for medicinal purposes.

Of antient British C., nothing is known; it was probably of an extremely rude description. Hares, poultry, and fish are said to have been forbidden as food. We do not find much mention of the art of C. in the Saxon chronicles. The Danes and Germans appear to have been great drinkers, and to have paid little attention to the preparation of their eatables. The Normans were more curious in these matters; some offices among them were held in right of the kitchen. In early English C. much use was made of the mortar. Oil and lard were used instead of butter. Several English C. books bear an early date, as *The Forme of Cury*, by Mr. Pegge, 1390; and others date as follows: Sir J. Elliott's book, 1539; Abraham Veale's, 1575; *The Widdowe's Treasure*, 1625.

The C. of France was probably of an imperfect and rude kind, till the introduction of Italian tastes by the princesses of the house of Medici. The ancient use of oil was modified by the discovery made by the French, of dressing meat in its own gravy. In our own day, there is no denying that the French cook is a true artist. We may, if we please, impute the trouble he takes with the dressing of his meat to the inferiority of the material, but this can be said of meat only; the preparation of vegetables and fruits is attended to with equal care, although, probably, the French have some of these things in greater perfection than ourselves. The great difference between French and English C. consists in the fact that the former cook their meat much longer. They consider that this renders it more digestible. They are thereby enabled to multiply dishes by altering or annihilating the original taste of the meat, and making it a vehicle for foreign flavors. The variety, daintiness, and grace of form which dishes thus acquire, is advantageously made use of by us, when we admit them at our repasts to mingle with the heavier and radically English joints. But, for ourselves, we desiderate the integrity of the form and flavor of all meats, considering that to be *over-cooking* which the French think only sufficient. In the point of economy, the French have a decided superiority over us. The French cook throws nothing away. Instead of going to the butcher for meat for stock, as the American cook does, he uses the trimmings for stock and glaze, and the skimmings of his boiled meats for purposes to which we apply butter or lard; and like a true workman, he produces great results from small means.

The estimation in which the services of a cook are held, may be known by the large salary attached to the office in great families, hotels, and club-houses. A visit to the kitchens of one of these establishments will teach us what a highly important post is that of *chef de cuisine*. There must be in such a person not only the necessary knowledge how things are to be done, but the power to arrange and direct the work of the numerous assistants, as to the exact part they must fulfill at each moment of their long and busy day. These places, indeed, are excellent schools for cooks, where they can undergo that severe training, without which a thorough practical knowledge of the business cannot be attained. It is indeed to be regretted—because a source of so much disappointment, discomfort, and waste—that a knowledge of plain C., at least, is not more desired by mistresses for themselves. That acquirement, and household management generally, are important enough to be made part of the education of all classes. The poorer would thereby be enabled both to lay out their money profitably, and to prepare their food so that it might satisfy and nourish them; and the heads of establishments in the upper classes would be more in a position to direct, appreciate, or, if necessary, condemn the performance of the cook. A cultivated and elegant taste is as much shown in the arrangement of viands as in the furnishing and decoration of the choicest boudoir.

The art of C., as a branch of female education, has latterly engaged considerable attention in America; and there are in New York, Boston, Philadelphia, and other places, establishments where young ladies receive this kind of instruction. A school of cookery has been attached to the South Kensington museum, London. Efforts are also made to teach C. to the humbler classes of girls, but much in this respect remains to be done. For any shortcomings in cooking, however, the taste of the American is in some measure accountable. The universal practice of roasting large pieces of meat, which cannot be consumed while hot, causes no little waste, and is obstructive of improvement. The Scotch—who derive some part of their C., along with other usages, from the French—deal more in soup and boiled meat than the English, and their processes while not less savory, are perhaps more economical. See CORSON, JULIET; PARLOA, MARIA.

So numerous are the books on C., that it would be out of our power to name even all the excellent ones. Among the latest are Mrs. S. T. Rorer, *Philadelphia Cook-Book* (1887); Parloa, *New Cook-Book and Marketing Guide* (1882); the numerous books by Marian Harland, and Alessandro Filippini, *The Table* (1890). See FOOD, BOILING, ROASTING, etc.

COOK ISLANDS, otherwise known as the Harvey archipelago, were visited rather than discovered by the navigator whose name they bear, during his first voyage. They lie about midway between the Society and Navigator groups, near lat. 22° s. and long. 158° west. The principal members of the cluster are Mangeia, Atiou, Harvey, and Raratonga. The natives, estimated at about 15,000, have been generally converted to Christianity; Raratonga, in particular, being one of the most successful missions in Polynesia.

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COOK'S INLET, one of the many gulfs of the Pacific ocean on the n.w. coast of America, lies between Prince William's sound on the e. and Bristol bay on the w., in lat. 58° to 61° n., long. 151° to 154° west. It was explored in 1778 by the navigator whose name it bears, in the vain hope of its leading him into the Arctic sea.

COOK'S STRAIT, discovered by Capt. Cook on his first voyage, separates the n. and middle islands of the New Zealand group. The proof of its existence dissipated the popular belief that New Zealand, as previously known, was merely a salient point of a great southern continent.

COOLERS, or CONTRIVANCES FOR COOLING, are resorted to by the brewer, and by the distiller of alcohol and other liquids. See BEER and DISTILLATION. They are also used in warm weather for the cooling of water (q.v.).

COOLEY, LE ROY CLARK, chemist, was born in Jefferson Co., New York, Oct. 7, 1833. He graduated at Union College in 1858, and in 1861 became professor of natural sciences in the N. Y. State Normal School. He left there in 1874 and became professor of physics and chemistry in Vassar College. He is the author of several text-books on chemistry and physics, that are highly esteemed among modern educators.

COOLEY, THOMAS MCINTYRE, b. N. Y., 1824. In 1843, he settled in Michigan and was admitted to the bar. He compiled and published the laws of the state, and in 1858 was made reporter of the supreme court. When the law department of Michigan university was established he was chosen one of the professors. In 1864, he was elected judge of the supreme court, and in 1868 chief-justice. His most important publication is *The Constitutional Limits which rest upon the Legislative Power of the States of the American Union*. He published, '76, *The Law of Taxation*; '85, *Michigan*; in 1887 he became chairman of the interstate commerce commission; resigned, 1891.

COOLIDGE, SUSAN. See WOOLSEY, SARAH CHAUNCEY.

COOLIDGE, THOMAS JEFFERSON, was b. Aug. 26, 1831, in Boston, Mass., and educated at Harvard University and in Europe. In 1892 he was sent as U. S. minister to France, but was superseded by James B. Eustis in 1893.

COO'LIES, or COULIES, originally the name of one of the aboriginal or hill tribes of Hindustan. From the circumstance that many of this tribe are employed as laborers and porters in Bombay and other places, the name is applied by Europeans in Hindustan to porters in general; and it is now used to denote emigrant laborers from India and China to tropical and other countries. The importation of this useful class of laborers to the Mauritius, West Indies, and British settlements on the mainland of South America, has grown up as a result of negro emancipation—the emancipated slaves showing an indisposition to become regular laborers. Hence the necessity for resorting to imported labor from India or China.

Much difference of opinion prevails as to the propriety of coolie immigration. It is one of those vexed questions on which something can be said on both sides. We would refer to Mr. A. Trollope's *West Indies and Spanish Main* (1860), for some general observations on the introduction of C. to certain British West India settlements. A later work by Mr. Jenkins, *The Coolie, his Rights and Wrongs* (1871), though relating exclusively to British Guiana, is full of most interesting matter. The conclusion at which he arrives regarding the system is thus expressed: "Taking a fair review of the whole system, it is one which, spite of its disabilities, its difficulties, its present evils, is full of promise, and, in my belief, can be made, with care, and skill, and honest endeavor, not only an organization of labor as successful as any hitherto attempted, but one leading to almost colossal benefits" (p. 367). Mr. Jenkins further asserts, that "any one who has seen the coolie in British Guiana is forced to admit that he has undergone a change for the better. In illustration of this, we may mention that the number of immigrant depositors in the British Guiana savings-bank on June 13, 1870, was 1817, whose deposits amounted to $188,425, or over $70 a head. The commissioners appointed by her majesty to take evidence on the working of the system at the time Mr. Jenkins went out, state in their report (pp. 854, 855): "From papers submitted by the immigration agent-general, the commissioners gather, that in 12 ships which sailed with returning Indian immigrants between 15th Nov., 1884, and the 11th Nov., 1869, 2,828 immigrants took away with them money acquired in the colony to the amount of $433,369, or £94,452." The great drawbacks of the system appear to be the reckless mode of recruiting in India; the insecurity, if not the actual worthlessness, in Guiana of contracts drawn up in the former country; the severe penalties attached to breach of contract, and the practical difficulties, as the law stands at present, in the way of the coolie obtaining a remedy for any injustice inflicted on him. Immigration from China was stopped for all the West Indies in 1867, on account of the Chinese government insisting on a return passage at the end of five years, which the planters find will not pay them for their outlay. The total number of C. at present in British Guiana is about 50,000.

"Among the most important provisions," says Governor Longden, "are those which regulate the allotment of immigrants upon their arrival in the colony, the supply of food to them during the first two years of their residence, their lodging, the medical attendance and hospitals provided for them, their wages, the exemption of women from labor, the prevention of vagrancy, and the right of repatriation." In proof of this it may be stated, that although the coolie has a right to a free passage back to India at the public

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expense, after a continuous residence in the island for ten years, in many cases he has preferred to commute this right for a grant of ten acres of crown land, and to settle permanently in the colony.

Sir J. P. Grant, governor of *Jamaica*, is no less emphatic in expressing his opinion that a great change for the better has taken place in the treatment of the coolie in that island also. His words are (*Report* for 1871): "Under the old state of things this department [the immigration department] in Jamaica was in a disgraceful state, but it has now been completely reformed under the new system introduced by the new law of 1869." This law secures to the coolie full payment of day-wages at the rate fixed by law as a minimum, unless where he prefers task-work, and also regular daily rations during the whole of his five years' term of indenture, besides putting an end to all stoppages of wages at the arbitrament of only one party to the bargain. Many of the details of medical supervision are extremely creditable to the planters. The census returns for 1879 give the gross number of Indians at 15,134.

Some recent reports from the island of *Mauritius* are less encouraging, which is much to be deplored, because that island contains more C. than all the rest of our colonial possessions put together. Out of a total pop. of (1881) 359,419, more than 247,000 were Indian immigrants. It would seem that the relations between employers and employed are not quite satisfactory, though here too, improvement can be noted.

Besides what may be called the *legitimate* traffic in Chinese C. (stopped at present), an infamous counterfeit was long carried on at Macao (q.v.). Native crimps brought thousands of their countrymen to that Portuguese island, and shipped them for Cuba and Peru. This "involuntary emigration," as it has been called, began in 1848, and as many as 13,000 persons were shipped in the course of a year; but as in reality it was nothing more than an elaborate system of kidnapping, the Chinese and British governments, in 1872, prohibited any vessel suspected of being engaged in this trade, from fitting out in any Chinese or British port, and the "trade" was practically destroyed in consequence. At the close of 1873, the Portuguese government formally declared the "exportation" of C. illegal, and the atrocious traffic may now be considered at an end.

COOMANS, PIERRE-OLIVIER JOSEPH; b. Brussels, 1816; pupil of Van Hasselaere; his best-known pictures are, "The Deluge," "Emigration of Arab Tribes," "Algerian Dancing Girls," "Feast of the Philistines," "Last Days of Happiness at Pompeii," "The Delinquent," "Phryne," "Glycera," "Un Pasechevelé," "The Selfish Kiss," "The Last Hour of Pompeii—the house of the Poet," "Lucretia," etc. He d. 1889.

COOMASSIE or KUMASI, the capital of the kingdom of Ashantee, western Africa, is situated about 120 m. n.n.w. of Cape Coast Castle, in lat. 6° 35′ n., long. 2° 12′ w. C. occupies the side of a rocky hill, and is about 4 m. in circuit. The king's palace is here. C. was captured and burned in 1874 during the war with Great Britain, and a military expedition proceeded there in 1895–6. The king submitted and a British Resident was appointed to the city. See ASHANTEE. Pop. stated by natives to be 100,000; but other reports say 20,000.

COONS. A popular name for the Whig party in 1838–45, when the raccoon formed the emblem of the party. See PARTY NAMES.

COONTIE, or COONTA, a plant of s. Florida, the stem of which furnishes starch from which arrowroot is made. In the Bahamas and other countries it is called sago.

COOPER, a co. in central Missouri, on the Missouri river, intersected by the Missouri Pacific, and the Missouri, Kansas, and Texas railroads; 562 sq. m.; pop. '90, 22,707, with colored. The surface is undulating and hilly, and the soil fertile, producing wheat, corn, tobacco, etc. There are mines of coal, iron, and lead, and quarries of marble and hydraulic limestone. Co. seat, Boonville.

COOPER, ANTHONY ASHLEY. See SHAFTESBURY.

COOPER, Sir ASTLEY PASTON, a celebrated English surgeon, was born in Norfolk, where his father was a curate, in Aug., 1768. In his 16th year he went to London, and placed himself under the care of Mr. Cline, one of the most noted surgeons of his day. He devoted himself with ardor to his profession, and was a constant attender at the dissecting-rooms, and also at the lectures of the famous John Hunter. In 1789, C. was appointed demonstrator of anatomy at St. Thomas's hospital; and four years after, he assisted Mr. Cline, who was surgeon at St. Thomas's, in the course of lectures on anatomy and surgery. In 1793, he was appointed professor of anatomy at surgeons' hall; and in 1800, surgeon to Guy's hospital. In 1813, he received the professorship of comparative anatomy in the college of surgeons. Meanwhile, C. had been enriching medical literature by various contributions. An essay on the effects resulting from the destruction of the *membrana tympani* gained him, in 1802, the Copley medal of the royal society, of which he was elected a fellow three years afterwards. In 1804–7, appeared his great work on *hernia*, with illustrations mostly of life-size, a contribution of the utmost value to medical science—the anatomy of the disease and the mode of operating for its relief being alike ill understood before—though in a pecuniary point of view it proved very unprofitable to himself. The practical part of his profession was not neglected during this time. He was the first to attempt the tying of the carotid artery, an attempt which, though unsuccessful in his hands, has since proved effectual

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in the hands of other practitioners. His annual income, which in the fifth year of his practice only amounted to £100, had in 1813 risen to the enormous sum of £21,000, perhaps the largest ever received by a surgeon. In 1817 he tried what was considered the boldest experiment ever attempted in surgery, the tying of the aorta, which did not prove successful. In 1820, C. removed a steatomatous tumor from the head of George IV., who marked his appreciation of the operation by conferring a baronetcy upon C. some six months after. He d. in 1841. His chief work is that on *Dislocations and Fractures* (1822).

COOPER, James Fenimore, American novelist, was born at Burlington, N. J., Sept. 15, 1789, and was the son of Judge William Cooper, member of an old Quaker family, and Elizabeth Fenimore, a lady of Swedish descent. In 1788, Judge Cooper, who owned large tracts of land in New York state, laid out the village of Cooperstown, and in 1790 removed his family thither. Young Cooper received a limited education at the village school, and then was sent to Albany to be fitted for college by the rector of St. Peter's church. He entered Yale in 1802, but in his junior year was dismissed for some misdemeanor, and in 1806 shipped as a kind of apprentice in a merchant vessel plying between New York and European ports. The navy offering prospects of advancement, since his father had been a representative in Congress, and was a leading Federalist, Cooper regularly entered as a midshipman in 1808, and rose to the rank of lieutenant, but in 1811 married a sister of Bishop De Lancey, of New York, and soon after resigned his commission. In 1814 he removed to the vicinity of Cooperstown, but in 1817 left, to make Scarsdale, Westchester county, his home. Here he led the life of a country gentleman until 1820, then suddenly, and without previous inclination towards authorship, he began to compose, and during that year published, anonymously, *Precaution*, a tale of English social life, which attracted little attention either in the United States or England. Urged by friends to depict American scenes, he wrote *The Spy* (1821), a novel which received high praise on both continents. *The Pioneers* (1823); *The Pilot* (1824), said to be the first sea-story, properly speaking, ever written; and *The Last of the Mohicans* (1826) increased his fame, and in France and Germany he was considered equal if not superior to Walter Scott.

From 1822 to 1826, Cooper lived in or near New York City. The period 1826–33 was spent abroad, and for several years he was consul at Lyons. With *The Prairie* (1827), *The Red Rover* (1828), *The Wept of Wishton-Wish* and *The Water Witch* (1830) ended what has been called "the most fortunate decade" of Cooper's life. A decline in popularity followed, owing to a change in literary taste, to certain political opinions championed by him, and to severe strictures on American and English life and traits made in his books of travel (1836–38) and in later works. He was slandered and ridiculed by the Whig newspapers of New York state, and engaged in a series of libel suits in which he defended himself with great ability, pleading his own cases and generally winning them. Of the thirty-two novels written by Cooper, *The Pathfinder* (1840) and *The Deerslayer* (1841), were most highly esteemed by himself. Among his other works are, *Homeward Bound* (1837); *History of the United States Navy* (1839); *The Two Admirals* (1842); *Satanstoe* (1845), one of three novels denouncing anti-rent doctrines (see Anti-Renters), and *Lives of Distinguished American Naval Officers* (1846). Cooper's last book, *The Ways of the Hour*, a story written to expose the defects of trial by jury, and a comedy, which failed on the stage, were produced in 1850. He lived at Cooperstown from 1834 until his death, Sept. 14, 1851.

Cooper's works have been translated into many languages, European and Oriental, and in his own country have risen in popularity since his death, his place among American authors being a fixed and distinctive one. His literary style is defective, and many of his incidents are improbable, but he has enriched fiction with some original characters—"Leatherstocking," for example—and in describing the exciting life of the frontier, the forest, and the sea, and the varied aspects of nature, he is always vigorous and often brilliant. Cooper is described as having a large form and an intellectual, handsome face. In character he was passionate, obstinate, bigoted, and provincial; but at the same time he was generous, magnanimous, high principled, and intensely patriotic. See *Life* by Lounsbury (Boston, 1882), and Lowell's *Fable for Critics*.

Susan Fenimore, Cooper's eldest daughter, 1813–94, was the author of *Rural Hours* (1850); *Rhyme and Reason of Country Life* (1854), a compilation; and other works.

COOPER, Peter, 1791–1883; b. New York; manufacturer and philanthropist. He assisted his father in his successive occupations of hatter, brewer, and brick-maker; gained such education as his limited means allowed, and from 1808-12 was apprenticed to a carriage-builder. He invented a machine for shearing cloth, which was used during the war of 1812–15; then manufactured cabinet-ware; was for a time a grocer, and finally established a glue and isinglass factory on Long Island, continuing the business for more than 50 years and acquiring great wealth. In 1828 he built large iron-works in Baltimore, and afterwards a rolling and wire-mill in New York, and blast furnaces in Pennsylvania. In 1830 he designed and built the first locomotive engine used in America, and about 1845 made at Trenton the first rolled iron beams for building purposes. He was among the earliest to promote telegraphic communication in the U. S., and for 18 years was pres. of the New York, Newfoundland and London telegraph co. He invented a method

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of propelling canal-boats by an endless chain. He was prominent in the affairs of his native city, and aided in establishing the old public school society. In 1876 he received the independent nomination for president. His great work was the erection and endowment of the Cooper Union, in front of which a statue of him, by St. Gaudens was unveiled May, 1897. See *Life* by Mrs. Carter (1889).

COOPER, THOMAS, 1805–92; an English chartist, in youth a shoemaker, and self-educated so as to become a schoolmaster at the age of 23. He was the leader of the Leicester chartists in 1841, lectured during the riots, and was found guilty of conspiracy and sedition, and sent to prison for two years. While in jail, he wrote an epic poem, *The Purgatory of Suicide*, and a series of stories entitled *Wise Saws and Modern Instances*. Some time afterwards he wrote papers on *The Condition of the People;* later still, *Triumphs of Perseverance* and *Triumphs of Enterprise*. In 1848, he was lecturing: in 1849, editing a radical penny paper; in 1850, conducting a free-thinking publication. Near the close of 1855, he gave up skepticism, and afterward almost continually lectured in support of Christianity. His poetical works were published in 1878.

COOPER, THOMAS, LL.D., 1759–1840; a native of London, educated at Oxford, studied medicine and law, and was admitted to the bar. He visited France in the interest of the English democratic clubs, and became conspicuous among the Girondists, for which he was taken to task by Burke in a speech in the house of commons. Cooper wrote a virulent reply, but its circulation was prohibited by the government. Coming to the United States, he started law practice in Philadelphia, and soon mixed in politics in opposition to the administration of John Adams, on whom he made a gross attack in a newspaper. Under the alien and sedition laws, he was tried for libel, convicted, and sentenced to a fine and six months' imprisonment. As soon as the democratic party came into power, he was rewarded by the appointment of judge, but he soon became so odious to the party that he was removed. In later years, he was professor of chemistry in Dickinson college, in Pennsylvania university, and South Carolina college in Columbia, of which he became president. His latest work was a revision of the statutes of South Carolina. Among his works are *Information Concerning America; An English Version of the Institutes of Justinian; Lectures on the Elements of Political Economy*, etc.

COOPERAGE, the art of making vessels of pieces of wood bound together by hoops. It is a very ancient art, such vessels having been in use among the Romans at the period of the Christian era. The upright pieces forming the sides of a barrel, or cask, or other cooper's work, are called *staves;* and, as casks are usually larger in the middle than at the top and bottom, this swelling, called the *belly* or *boulge*, is formed by skillfully shaping each stave so that it shall form part of the required double conoid, and that, when all are built and hooped together, their edges shall coincide perfectly; for this purpose, each stave is made broadest in the middle, and narrowed down in a curved line towards each end. A skillful cooper can work this curve so accurately that no further fitting or alteration shall be needed when the staves are put together. The staves are made to meet at their inner edges, and by driving the hoops very hard, the inner part is compressed until the slight gaping outside is closed, and thus slight inaccuracies of fitting are remedied.

There are several branches of cooperage. The *wet* or *tight* cooper makes vessels for holding liquids. The *dry* cooper does inferior work, such as barrels for containing dry goods, where an inferior degree of accuracy is sufficient. The *white* cooper makes churns, pails, etc., which for the most part have straight sides.

The best work is made of oak, which must be thoroughly dried before being put together. In warm countries, the drying of the sun is sufficient, and casks are therefore mounted in summer only; but in Britain, artificial drying is commonly resorted to. The hoops are hammered down from the narrow to the wide part of the cask, by means of a mallet striking a piece of wood held against the hoop. Iron hoops are sometimes put on hot, in order that their contraction on cooling may bind the work together.

CO-OPERATION, in the social and economic sense of the word, generally means the association of work people for the management of their own industrial interests in store, workshop, or other undertaking, and the equitable distribution of profits among those who own them. Co-operative enterprises may be divided into two classes: first, those in which co-operative production is attempted; second, those which aim only at distribution. Co-operative production, in turn, falls into two classes, namely: production in which laborers co-operate and select their own manager, dispensing with the capitalist-employer; and production in which the laborer and his capitalist-employer co-operate in the sense that the laborer receives a certain share of the profits. The latter form of co-operative production is termed profit-sharing. Co-operative schemes in which the laborer assumes the functions of the employer have not on the whole proved successful. The causes of failure were generally the jealousy of the workingmen toward their elected manager, and their unwillingness to pay such an amount as business ability could command elsewhere. The result was as a rule, that these enterprises have been poorly managed, except in the rare cases in which a man has united enthusiasm for the success of the enterprise with an ability to conduct it efficiently, and has run the business for the good of the cause without regard to his own financial returns. Profit-sharing and schemes for co-operative distribution have been more successful.

Early in the nineteenth century, or before it, there had been instances of co-operative industry among English miners, New England fishermen, and the Greek sailors of the

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Levant. The first co-operative society in England was founded in 1794 at Mongewell, Oxfordshire, by Shute Barrington, bishop of Durham. During the Owenite agitation, 1820–45, hundreds of societies rose up, which, for the most part, rapidly disappeared. In 1844, 28 weavers, nearly all of whom were socialists of the Owen school and Chartists, founded the Rochdale Society of Equitable Pioneers. See ROCHDALE PIONEERS. With a capital of £28, they opened a store for supplying themselves with provisions, beginning with flour, butter, sugar, and oatmeal. Their success was rapid, and was due chiefly to their device of limiting interest on shares to 5 per cent. and dividing profits among members in proportion to their purchases. By 1857 they had a membership of 1850, a capital of £15,000, and annual sales to the amount of £80,000. Since 1869 yearly national congresses of the societies have been held. Efforts after organization culminated in the consolidation of the co-operative union, with a regular constitution drawn up in 1873. Subject to the congress, the union is governed by a united board whose members are chosen by each of the seven sections into which the union is divided. The sectional boards have monthly meetings of their own. The central co-operative board, consisting of all the members representing the seven sections, comes together for business only at meetings of congress. In 1895 the membership of the societies was nearly one million and a half, and their share capital amounted to £16,164,667; the net profit of the concerns was £5,397,582. Much attention has been paid by the societies to the education of their members, and regular examinations are held each year in auditing, bookkeeping, and the principles of co-operation. Local festivals, annual meetings, concerts and lectures are also features of the activity of the organizations. The principle of co-operation has been extended to farming in Great Britain with some success. There is also a Women's Co-operative Guild, which in 1896 numbered 200 branches, with a membership of over 9,000. The Wholesale Society is a federation of retail societies, which have to take up shares, and they participate in the management in proportion to their membership. It has boot and shoe factories at Leicester, soap-works at Durham, woolen cloth works at Batley, etc. Besides the productive works of the Wholesale Society, there are societies for production alone, societies for working corn-mills, etc.

The various professional and civil service stores are simply a result of the application of the co-operative system for the supply of the wants of the middle classes, especially the professional classes and clerks, begun in 1864; and these stores now do a very large business, the largest being the army and navy stores in Victoria st., London. The salient difference between this middle class co-operation and that of the workingman is that the former admits of the system of privileged shareholders, whereas all the benefits of the latter are open to every one who pays an entrance fee of one shilling.

In *France* the industrial partnership system, by which the capitalist gives his workmen a share of his profits, has made greater progress than the co-operative movement properly so called. At the revolution of 1848 the government gave some scanty subsidies to co-operative bodies and a large number of co-operative organizations sprang into existence, but Gide, the French economist, points out that of these, few, if any, were in existence at the time of his writing, in 1890. As to profit sharing, France was the country of its birth, and in France it has made more advance than in any other country. The famous establishment of Leclaire tried experiments in this line and was on the whole successful. Its example has been followed by many others. In the mining centres of France the organization of co-operative stores has been attended with great success. In 1865 a society of this sort was organized at Anzin, on the principle of a joint-stock company, from which speculative interest in the stock was eliminated. Each member of the society must own one of the shares, and cannot own more than two. The society buys merchandise at wholesale rates and sells it to its members at a small profit. Since 1866 its progress has been steady, the membership in that year being 577 and in 1894, 3,760, while during the same interval the capital rose from five million and a-half to over thirty-six million dollars. After the running expenses are paid, the profits left over are applied to the payment of a 5% dividend on the stock, and if any profits still remain, they are distributed among the purchasers in proportion to the value of their purchases during the year. Between 1866 and 1895 profits to the amount of $1,266,332 were distributed among the members. This amount equalled 12½% of the total value of sales.

In *Germany* C. has flourished greatly in the form of people's banks. These originated in 1849 under the auspices of Schulze-Delitzsch, at the little town of Delitzsch in Saxony. Membership in these associations entitles a man to receive loans under advantageous conditions. In other words they are mutual credit associations. Their number has greatly increased and they are now a very important feature of industrial life in Germany. There are also a large number of societies whose function it is to provide mutual credit for the small farmers of the country. The productive associations are not so numerous in Germany, but the co-operative dairies have been successful. Ferdinand Lassalle, founder of the Social-Democratic party in Germany, hoped much from the co-operation of workingmen in production, and, thinking that the only difficulty in the way was the inability of workingmen to secure the requisite capital, he tried to establish a system of state-aided co-operative bodies. The government was to loan the capital, under certain conditions, to workingmen entering into these associations. Lassalle's attempt was not successful, nor has the experience of co-operative productive establishments justified his views. If the credit of a co-operative body is

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good it will have no difficulty in obtaining loans in the market; if it is bad the government ought not to embark the public money in the enterprise. These objections were urged by the opponents of Lassalle's scheme. In regard to co-operative distribution in Germany, an interesting experiment has been made in the co-operative stores of the Krupp firm at Essen. These were started in 1868, and they included a large number of stores dealing in a great variety of goods. Trade with these stores is not confined to the employés of the firm, but only the latter are entitled to share in the profits. The system developed rapidly and in 1891 comprised 68 shops. In *Austria* and *Hungary* the Schulze-Delitzsch system has been copied largely. In *Belgium* co-operative organizations are found on a very considerable scale at industrial centers such as Ghent, in stores, bakeries, and in fisheries. In *Denmark* co-operative dairies have made remarkable progress, and in *Italy* co-operation has made great progress, chiefly in the form of people's banks. In general it may be said that the movement for co-operative distribution, which began in England in the forties and still has reached its greatest development there, is now established in all the countries of Western Europe and in Italy.

In the *United States*, co-operative production, even in the form of profit-sharing, has had less success than co-operative distribution, but a successful venture in this line was made by journeymen coopers in Minneapolis, in 1868. They attempted to manage their trade for themselves, and with such success that they formed, in 1874, a strong organization known as the Co-operative Barrel Company. Their example was followed by others, but not always so successfully, because the conditions among coopers were especially favorable to this form of enterprise. Experience seems to show that where articles are produced to order and not for the general market, co-operative production may succeed, but that these enterprises fail when they are confronted with the difficulty of adjusting the supply to the variations of the market demands. Profit-sharing in the United States has been tried here and there with good results, as, for example, in the town of Ivorydale. The theoretical objection to profit-sharing is that, while a workingman shares in the gains of the establishment, he is in no wise called upon to suffer any portion of its losses. Again, it is frequently a feature of profit-sharing schemes that the firm retains and turns over in its business the workingman's share, at least during certain long intervals of time. It is thus a sort of compulsory savings institution, and as such does not readily find favor with workingmen of an independent spirit. Far more important, in the United States, than profit-sharing or any other form of co-operative production, are the organizations for co-operative distribution. The co-operative stores began with the so called union stores in New England, between the years 1847 and 1859. For the most part these failed, or were turned into private enterprises. In 1864 the Rochdale methods were imitated in the United States with better success. Fourteen years later reports from 94 councils of co-operative bodies gave the total trade as $1,089,372, on which the saving of the consumers, through co-operation, was estimated at 14 per cent. About one-half of these stores were conducted on the Rochdale system. Later experience showed this system to be the most practicable. A table, prepared by Prof. E. W. Bemis, shows the returns of fifteen New England societies organized on the Rochdale plan for the years 1895–6. They had an average business of $374 to $100 of capital and their sales during the year amounted to $1,008,977. The average wages of the employés in ten of the largest societies was $609.64 a year. The principal features of the Rochdale plan are as follows: (1) Small shares of stock are issued, usually limited to $5.00. (2) The number of shares which a member can hold is limited to 100, and sometimes to 40. (3) Each stockholder has but one vote, whatever be the number of his shares. (4) Goods are not sold at cost, but at the market price. (5) Stockholders receive only a fixed rate of interest, and the profits that remain after this interest is paid are divided among the customers according to their purchases.

Building-loan associations have become of great importance in the U. S. The members subscribe for a given number of shares and pay one dollar on each share every month for a term of years, until the sums paid and the interest on them amount to $200—the full value of the shares. This usually requires about 10 years. The money thus provided is loaned to the highest bidder. Each shareholder who builds or buys a house can, in order to help pay for it, borrow a part of the accumulated fund equal to the full value of his shares, paying the stipulated interest on it monthly, and giving, as security, a mortgage on the house. When his shares attain their full value, he has enough to pay the principal of the debt and cancel the mortgage.

From the above facts it will be apparent that the purpose and tendency of the co-operative movement is that the workmen, through the principle of associated industry, by means of a joint capital, should equitably manage their own affairs so far as they can. Such management, we have seen, has been applied on a large scale to distribution and to people's banks, and has had a considerable success also in various forms of domestic production, as in corn-mills, bakeries, boot and shoe factories, dairies, etc. In the large and staple branches of manufacture it has as yet done very little. But so far as it has gone, the movement has been a real and effectual training for the intelligence, business capacity, and moral character of the workmen. It has taught them thrift, foresight, self-control, and the habit of harmonious combination for common ends; and it has opened up an unlimited field for peaceful, hopeful, and successful effort in the future.

See Holyoake's *History of Co-operation* (2 vols.) and his *Self-help a Hundred Years Ago* (1888); *Reports on Co-operation in Foreign Countries*, a blue book issued in 1886; *Workingmen Co-operators* by Acland and Jones (1884); *English Associations of Work-*

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ingmen, by Dr. Baernreither (1888); *History of Co-operation in the United States* (Balt., 1888); Barnard's *Co-operation as a Business* (1881); N. P. Gilman's *Profit Sharing between Employer and Employee; Proceedings* of the 28th annual co-operative congress of Great Britain (May, 1896); *Bulletins* of the U. S. Dept. of Labor, 1896. See FRIENDLY SOCIETIES.

COOPER RIVER, a stream in South Carolina, rising in Charleston co., flowing s. e. and uniting with the Ashley below the city of Charleston. It is navigable for 30 m. to a canal connecting with the Santee.

COOPERSTOWN, a village and county seat of Otsego co., N. Y., 90 m. w. of Albany; at the outlet of Otsego lake; reached by the Cooperstown and Charlotte Valley railroad; pop. 2657. It is in a hop growing and farming region. The American novelist, James Fenimore Cooper, had his residence here, as did his father, after whom the village is named. It has a union free school and a hospital.

CO-ORDINATES. What is called the method of C. is an invention of Descartes, whereby algebra and the calculus may be employed in geometrical investigations. The method is sometimes called algebraical geometry—sometimes, and more properly, analytical geometry; and it is commonly treated under the heads "geometry of two dimensions," and "geometry of three dimensions," according as it is applied to investigate the properties of figures all in one plane, or of curved surfaces. The method is capable of popular explanation. C. are lines so measured off from a fixed point, called the origin of C., along fixed lines passing through it, called the axis of C., as to determine by their quantities the position of any other point relative to the origin. The first step is to find how to determine the position of a point in a plane. Take any fixed point in it for the origin of C., and through it draw two fixed lines—the co-ordinate axes—at right angles to one another. Then, if the perpendicular distance of the point from each of these axes be given, its position will be determined. Referring to Fig. 1, if P be the point, and O be taken for the origin of C., OX, OY for the axes, then if we know NP or OM, the perpendicular distance of P from OY, and measure off from O, OM on the axis OX, and through M raise a line perpendicular to OX, P must lie in this line, for it contains all the points in the plane which are at the perpendicular distance OM from the axis OY. Similarly, if ON or PN, the perpendicular distance of P from the axis OX, be known, and we measure that distance off from O along OY, and through N draw a perpendicular to OY, the point must be in that perpendicular. It is therefore at the intersection of the perpendiculars through M and N respectively.

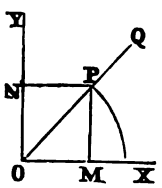


Fig. 1.

When, as in the figure, the fixed lines are at right angles to one another, the C. OM, ON are called the rectangular C. of the point. Let us now see what use can be made of this mode of determining the position of the point, for the discovery of the properties of lines and surfaces. As the values of the C. change for the different points in the plane, they are denoted by the variables x and y. Now, if we suppose the point P to begin to move according to a determinate law, and the C. to change their magnitudes so as always to be its C., knowing the law of P's motion, we are able to express in algebraical language the law of the corresponding changes in its co-ordinates. For instance, if P moves so as to be always at the same distance from O, OP is constant, and (47th Prop. Euclid, Book I.) the square on OP is equal to the sum of the squares on OM and PM. Putting this into algebraical language, we have the equation, $x^2 + y^2 = R^2$, or $y = \pm \sqrt{R^2 - x^2}$, where R = OP. This is called the equation of the circle referred to its center as origin, and to rectangular C.; and it expresses the law according to which the changes of the C. must take place: and from this equation, combined with that to a straight line, etc., every property of the circle may be determined. If P move so that the sum of the distances from two fixed points shall be always the same, and we express the relation between x and y in that case, we should have the equation of an ellipse. This suffices to show in a general way the nature of the method. Equations between x and y are called the equations of the lines, whether straight or curved, traced out by the point P; and by means of them, though they but express relations between *quantities*, the *qualities* of the lines to which they refer may, by artifices explained in every treatise on the subject, be detected. Nay, by assuming equations between x and y, and examining the lines which points represented by them would trace, many singular curves have been discovered. There are a variety of conditions to be attended to in the interpretation of such equations, depending on the assumptions set out with, in choosing the origin and axis. The axis of x or OX being taken to the right of the origin, and the axis of y or OY being perpendicular to it and above it, x and y are counted positive when they are measured along their axes to the right of and above the origin respectively, and negative when they are measured to the left and downwards respectively. Suppose $x = OM = ON$, and $y = MP = MP_1 = NP_2 = NP_3$, the C. of the points P, P_1, P_2, P_3 would be $(+x, +y)$, $(+x, -y)$, $(-x, +y)$, $(-x, -y)$ respectively. These points being equidistant from O, we may suppose a circle to pass through them.

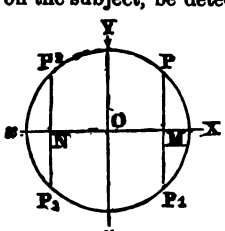


Fig. 2.

Recurring now to the equation of the circle, $y = \pm \sqrt{R^2 - x^2}$, the meaning will be seen of the two values + and − of y given by the quadratic. Often the axes of C.

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selected for convenience are oblique, i.e., inclined at some other angle than a right angle. An equation between C. referred to one set of axes may always be transformed to C. referred to another, by the process known as the transformation of co-ordinates. A similar transformation of equations by the same process may be made where it is desired to refer the line to a new origin.

What has hitherto been said refers entirely to the C. of a point in a plane, or to what is called geometry of two dimensions. But the rationale is the same with that of connecting in equations the C. of points in space—the subjects of geometry of three dimensions. The position of a point in space requires three C. to determine it, and these are usually denoted by the symbols x, y, z. An origin being taken, and three axes, OX, OY, OZ, mutually at right angles to one another, the point is referred to the three planes through these axes. z, or PN, is its height above the plane though YOX; y, or NM, is its distance perpendicularly from the plane XOZ; and x, or OM, is its perpendicular distance from the plane ZOY. It is clear that these three determine the position of the point. In three dimensions, as in two, the problem may be stated to be: Given the law of the motion of P, to express the law regulating the variations of its C. as it moves. The algebraic expression of the latter law is, the equation of the surface traced by the point in moving over all the space it can traverse consistently with the law of its motion. The method of C., besides its use in geometry, is of great value for resolving forces in mechanics, and also for finding the resultant of a great many of them.

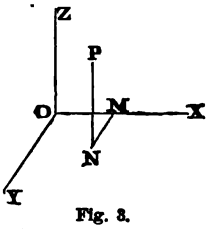


Fig. 8.

COORG, or KURG, a district under the government of India, bounded by Mysore, Malabar, and Canara, is situated in lat. 11° 56′ to 12° 45′ n., long. 75° 25′ to 76° 13′ east. It contains 1,583 sq. m., and in 1891, 173,055 inhabitants. Down to 1834 it was a native principality of ampler dimensions. As at present defined, C. appears to be wholly within the basin of the Cauvery, one of the chief tributaries of the bay of Bengal. From its elevated situation—the lowest point is more than 3,000 ft. above the sea—C. is exposed to both the s.w. and n.e. monsoons. Hence the yearly fall of rain amounts to about 120 inches. For the same reason, the temperature is comparatively low and equable. Nearly the whole of this rugged region is covered with forests, more or less dense, but seldom so full of undergrowth as to form jungle. The zoology of C. comprises elephants, tigers, bears, etc., with birds and reptiles in vast variety. The Coorgs or Kudagus are handsome and athletic. Among them there exists a community of wives between brothers. But C. has perhaps nothing so worthy of notice as its artificial fortifications. The country is intersected by ramparts, which are from 15 to 25 ft. in height, and by ditches of about 10 ft. in depth and about 8 in width; while, being in some places double or triple, or even quadruple, they measure in aggregate length upwards of 500 miles. These works are very ancient. The true name of this territory is *Kudagu*, C. being a corrupt form.

COÖS, a co. forming the n. portion of New Hampshire, bordering on Maine and Canada, and separated from Vermont by the Connecticut river, intersected by the Androscoggin river, and traversed by the Maine Central, the Boston and Maine, and the White Mountain railroads; 1771 sq. m.; pop. '90, 23,211. The surface is hilly and the climate cold. The chief productions are oats, potatoes, butter, wool, and maple sugar. Co. seats, Colebrook and Lancaster.

COÖS, a co. in s.w. Oregon, on the Pacific ocean, watered by the Coös and the Coquilla rivers, and bordered on the e. by the Umpqua mountains; 1750 sq. m.; pop. '90, 8874. Productions, chiefly agricultural. Gold, copper, and iron have been found. Co. seat, Empire City.

COOSA, a co. in central Alabama, watered by the Coosa and Hatchet rivers; 684 sq. m.; pop. '90, 15,906, includes colored. The surface is hilly, but the soil is productive, yielding corn, cotton, etc. Co. seat, Rockford.

COOSA RIVER, rising in n.w. Georgia, and flowing through n.e. Alabama until it joins the Tallapoosa, the two forming the Alabama. The Coosa is about 350 m. long, and navigable in some parts.

COÖS BAY, an arm of the Pacific ocean in Coos co., Oregon, about one mile wide and 15 m. long, a safe ship harbor having a depth of water for ships of 2000 tons. It is about 200 miles south of Portland.

COO'SY, or KUSI—not to be confounded with the much smaller Coossy which enters the Hoogly from the right below Calcutta—is one of the largest rivers of India. It rises in lat. 28° 25′ n., and long. 86° 11′ e., on the southern slope of the Himalayas, receiving, however, at least one affluent from the northern face of that range. On emerging from the mountains, in lat. 26° 45′, and long. 87° 13′, it shows a greater volume than does the Ganges itself, in the corresponding position of Hurdwar. After a course of 325 m. in all, through the state of Nepaul and the district of Purneah, it joins the Ganges from the left, in lat. 25° 19′, and long. 87° 19′.

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COOT, *Fulica*, a genus of birds of the order *grallæ*, either ranked in the family *rallidæ* (rails, crakes, etc.), or in a separate family, *lobipedidæ*, which differs chiefly in having the toes edged with a scolloped membrane, thus making an approach to the web-footed birds. Coots have a strong, straight, and somewhat conical bill, the base of which extends up the forehead, and there dilates so as to form a remarkable naked patch. The tail is very short. They are aquatic in their habits, preferring lakes or pools with reedy margins, and retreating among the reeds on any alarm. The common C. (*F. atra*) is found in most parts of Europe, Asia, and the n. of Africa; occurring in the more northerly regions as a summer bird of passage, which is the case in the n. of Scotland; although in the more southerly parts of Britain it is plentiful during winter. It is about 16 in. long, of a black color, with a narrow white bar across the wings, and the naked patch on the forehead pure white, from which it is often called the bald coot. It makes a large nest of water-plants among reeds or rushes. Although not very highly esteemed for the table, the circumstance that many can be killed by a single shot, on the mud-banks to which coots resort in winter, as on the s. coast of England, makes C. shooting profitable to the fowlers who purvey for the market.—The American C. (*F. Americana*), a very similar species, is found in all parts of North America, from the West Indies to the Saskatchewan. See illus., OSTRICH, ETC., vol. XI.

COOTEHILL, a t. in the n.e. of Cavan co., Ireland, on the Cootehill, an affluent of the Annalee, 28 m. w.n.w. of Dundalk. It consists chiefly of four wide streets, and is situated at the w. end of a series of lakes navigable for about 7 m. to the e. to near Ballybay. It has a trade in linen. Pop. 1000.

CO'PAIS, LAKE. See BŒOTIA.

COPAI'VA, or **COPAIBA,** BALSAM OF, a valuable medicinal substance, consisting chiefly of a resin (*resin of copaiva*) and a volatile oil (*oil of copaiva*). It flows from incisions made in the stems of trees of the genus *copaifera*, trees with pinnate leaves, of the natural order *leguminosæ*, sub-order *cæsalpiniæ*, natives of the tropical parts of America. It has a peculiar, not disagreeable odor, and an acrid taste. It has stimulant properties, is diuretic when taken in small doses, aperient in larger doses; but is principally useful from its powerful action on the mucous membranes. It is much used in affections of the urino-genital system, and is also employed in chronic catarrhs, etc. Balsam of C. is not unfrequently adulterated with castor oil. The wood oil or gurgina balsam (q.v.) of India, the produce of a species of *dipterocarpus*, is sometimes sold in Britain as balsam of copaiva.

CO'PAL, a resinous substance used for a variety of purposes in the arts. It appears in commerce in smooth rounded masses, colorless or lemon-yellow, translucent or transparent, rather brittle, and in a cold state almost without smell or taste. It is readily fusible and inflammable, is insoluble in water, and only partially soluble in alcohol and oil of turpentine, but becomes entirely soluble in them when it has been for a short time melted. Various useful pale-yellow or almost colorless varnishes and lackers are made of melted C. and alcohol, oil of turpentine, or boiled linseed oil.

C. is said to be a general Mexican name for resins or gums, and the C. of commerce was, perhaps, originally brought from Mexico. C. is also obtained in Africa, Brazil, Madagascar, and India. Mexican C. is now believed to be the produce of a species of *hymenæa*, a tree of the natural order *leguminosæ*, sub-order *cæsalpiniæ*. *Vateria indica*, a large tree of the natural order *dipteraceæ*, yields the C. of India, very nearly resembling true C. in its properties, but also sometimes called gum animé (q.v.) in British commerce.—A mineral substance resembling C., and therefore called *fossil C.* or *copaline*, is found in some places, as at Highgate, near London, from which it is called *Highgate resin*.

COPAL'CHE BARK, a bark resembling cascarilla bark (q.v.) in its properties, and produced by shrubs of the same genus, *croton pseudo-china* and *C. suborosum* (see CROTON), natives of Mexico. The former yields a variety in small quills; that produced by the latter is in larger quills, and has a corky epidermis. C. B. is much used as a substitute for *cinchona*, in the cure of intermittents in Mexico, and is imported, although not to a large extent, into Europe.

COPALM. See LIQUIDAMBAR.

COPAN', a ruined city of Honduras, on the borders of Guatemala, in Central America. It stands on a stream of its own name, an affluent of the Motagua. The remains, extending about 2 m. along the river, comprise a temple, various pyramidal structures and sculptured idols similar to those of Egypt and India.

COPAR'CENARY. An estate in England originating in descent to two or more persons, called thence coparcenars or parcenars. It generally arises under the rule of law which makes the daughters of one dying without male heirs inherit equally, but it may also arise by local custom, as in the case of gavelkind (q.v.). Although the property remains unsevered, yet each parcenar is entitled to a distinct share of it, and consequently there is no benefit of survivorship, but the right of each descends to his or her heirs, who are still called coparcenars with the surviving original parcenars. The rule of descent is also *per stirpes*, so that the heirs of one who has predeceased the common ancestor take only the share which would have come to their immediate ances-

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tor had he or she survived, and thus a grandson of the common ancestor will also exclude his own sisters. If one of the coparcenars alienates his share, the C. is destroyed, and the estate becomes a tenancy in common (q.v.). C. may also be destroyed by partition, when the estates become in severalty (q.v.). This may be effected either by voluntary agreement, or by a suit in chancery. Such parts of the property as cannot be divided (such as the manor-house, etc.), pass to the eldest sister or her issue, but an equivalent in value is assigned to the remaining sisters. An advowson (q.v.) is exercised in turns, according to seniority. If the estates in C. are by descent reunited in one person, they become again an estate in severalty.

COPARTNERY. See PARTNERSHIP.

COPE, an ecclesiastical vestment, worn during the celebration of mass, at processions, vespers, and other solemnities. The C. was originally a cloak worn for ordinary purposes. In form it is a semicircle, without sleeves and with a hood. It is fastened across the breast with a clasp or morse. Copes soon began to be ornamented with embroidery, and even with jewels; and so early as the 13th c. they became the most magnificent and costly of all the vestments of the priesthood.

COPE, a custom or tribute due to the crown, or lord of the soil, out of the lead-mines in Derbyshire.

COPE, CHARLES WEST, b. 1811; an English painter, the son of an artist. His first work exhibited was "The Holy Family," in 1831, since which time he has produced a great number of pieces. Among them are: "Hagar and Ishmael," "The Cronies," "Paolo and Francesca," "Flemish Mother," "Almsgiving," "The School-master," "The Cotter's Saturday Night," "Trial by Jury" (his first cartoon), "Meeting of Jacob and Rachel," and dozens of others. Among some of the latest are: "Taming the Shrew," "Anne Page and Slender," "Home Attractions," "Spring Time," "Bianca's Lovers," "Hope Deferred," and "Cameron's Welcome Home from the Explorations in Africa." He was one of the original members of the Etching club, and one of the trustees of the royal academy. He d. in 1890.

COPE, EDWARD DRINKER, grandson of Thomas Pym, was b. Philadelphia, 1840, naturalist and comparative anatomist, frequent contributor to scientific publications; writing on the herpetology of tropical regions, ichthyology of the United States, reptilia of several explorations, cetacea of the North American coast, extinct cetacea of the United States, etc. He was professor of geology in the University of Pennsylvania from 1889 until his death in 1897; was editor of the *American Naturalist.* He left his large and valuable biological collection to the University of Pennsylvania. He also published papers on *The Hypothesis of Evolution, Physical and Metaphysical; On the Method of Creation, or the Law of Organic Development; Extinct Vertebrates of the Eocene of Wyoming and Nevada; New Vertebrata from the Tertiary of Colorado; The Mechanical Causes of the Origin of the Hard Parts of the Mammalia* (1889), etc. D. 1897.

COPE, SIR JOHN, an English general of the first half of the 18th c., is known through his ignominious defeat at the battle of Prestonpans by the Highlanders, under prince Charles Edward Stuart, Sept. 21, 1745, and more widely through a sarcastic Jacobite song.

COPE, THOMAS PYM, 1768–1854; b. Penn.; a distinguished merchant in Philadelphia who started the first line of sailing vessels between that city and Liverpool. He was largely instrumental in introducing the Schuylkill water to Philadelphia.

CO'PEC, a Russian coin, the oldest kind in Russia, and the first substitute for furs as a medium of exchange. It is worth one-hundredth of a silver ruble or (1896) 39.2 cents.

COPENHA'GEN (Dan. *Kjöbenhavn,* "Merchants' Haven"), the capital of Denmark, is situated on the island of Sjælland, in the Sound, which is here about 15 m. broad, and includes the island of Amager or Amak, which is separated from Sjælland by a narrow arm of the sea, forming a fine and capacious harbor. Lat. 55° 41′ n., long. 12° 35′ east. C. lies very low, and was strongly fortified until 1864, when the land-works were destroyed, although the citadel of Frederickshavn, and some of the batteries on the sea, were left in a condition to admit of being defended in case of emergency. The old ramparts of the city and citadel, which are planted with trees, afford pleasant walks. The population of C. was, in 1890, 312,859. Copenhagen proper, in Sjælland, and Christianshavn on Amager, which form the main divisions of the city, are united together by the bridges Langebro and Knippelsbro. The business quarter of C. stretches from its noble harbor in a n.e. direction towards the principal and central square, Kongens Nyton, which in itself forms the focus of the life of the city. Further n. and e. of this point lies the aristocratic quarter, with the handsome Amalienborg square of royal and administerial palaces; and this district is bounded in the extreme n. by the citadel, and the adjoining public gardens and walks on the shores of the Sound. C. has suffered so severely during the last century from the effects of fires and bombardments, that the city contains comparatively few remains of antiquity. Amongst its few buildings of historical interest or intrinsic beauty, we may instance the metropolitan cathedral church, known as Vor Fruekirke, rebuilt after the bombardment of 1807, and distinguished now for possessing statues of Christ and the apostles, together with a kneeling angel bearing a baptismal shell-font, which were designed, and in part

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executed, by Thorwaldsen himself; Trinitatiskirke, only remarkable for its round tower, which is ascended by a winding causeway instead of steps; and Holmens' Kirke, containing interesting monuments to the great naval heroes, Juel and Tordenskjold. The royal palace, called Christiansborg, is one of the most extensive in Europe, though its architectural character is not high. It contains, however, a picture gallery, and some noble works of art by Thorwaldsen and others. The castle of Rosenborg, where the regalia are kept, contains interesting collections of objects of art; and the palace of Charlottenborg is now used as an academy of arts. The university was founded by Christian I. in 1479, but the constitution under which it at present exists bears date 1788. It has five faculties, all of which, with the exception of theology, are open to women. Connected with the university are a surgical academy, two observatories, a botanical garden, a polytechnic institution, and a fine library, containing also a great collection of ancient Persian MSS., and another of ancient northern MSS. C. is the centre, not only of Danish, but of northern literature and art, and is the seat of a number of societies for the advancement of these in all their branches, amongst which the most important are the literary and scientific association, founded in 1742; the academy of arts; and the royal society for northern antiquities, founded in 1825. The royal library contains a large number of volumes, besides great treasures of Sanskrit and other MSS. The museum of northern antiquities in Christiansborg is unrivaled in its kind, and contains an admirably arranged collection of *stone* weapons, ornaments, etc., to 500 B.C., bronzes to 500 A.D., and articles wrought in iron, silver, and gold to 1000 A.D., besides numerous specimens to illustrate arts and manufactures in Scandinavia during the Christian ages. The Thorwaldsen museum, opened in 1846, consists of works of art by that sculptor himself, and others left by him to the Danish nation, for which a separate building has been erected. C. contains also a number of well-supported benevolent institutions. Since the war of 1864, C. has rapidly recovered its commercial activity, and now its trade is steadily increasing. Extensive works in 1891–94 greatly improved its harbor facilities. A steam ferry connects the city with Malmö. Leather, wool, grain, and oils are its staple commodities. Its royal porcelain works have long enjoyed a European reputation, but, besides these and a few manufactories for gloves, glass, etc., C. has no branches of industry worthy of any special notice in this article.

About the middle of the 12th c., C. was an insignificant fishing-village, in the neighborhood of which bishop Axel, or Absalon, built a castle. He bequeathed the castle, village, and neighboring district to the bishopric of Roeskilde. In 1254, the village obtained the privileges of a town, and in 1443 king Christopher made it the capital of the kingdom. It was several times attacked by the Hanseatic league; was besieged and bombarded by the Swedes in the 17th c.; suffered grievously by fires in 1728, 1794, and 1795; witnessed a great sea-fight in its roads on 2d April, 1801, when the English, under sir Hyde Parker, with Nelson as his second in command, were victorious over the Danish fleet; and was bombarded by the English from the 2d to the 5th of September, 1807, when great destruction was wrought, both in houses and public buildings, and about 2,000 persons lost their lives.

COPERNICAN SYSTEM, THE, is that which represents the sun to be at rest in the center, and the earth and planets to move round it in ellipses; in other words, it is that which we now know, on unquestionable evidence, to be the true system of the world. It got its name from Copernicus, but, in point of fact, it may be described as being a growth to which he was only one of many contributors. The merit of having first formed the general notion of the system seems to be due to Pythagoras; Copernicus has the credit of having, after the lapse of centuries, again drawn the attention of philosophers to it, and of having greatly increased the probability of its truth by his calculations and arguments· for the rest, the glory of having matured its idea belongs to Kepler, Galileo, and others, and to our own Newton, who, through the discovery of the law of gravitation, demonstrated its truth effectually. Many who have been used to reverence the name of Copernicus in connection with this system, would be surprised to find, on perusing his work *De Revolutionibus Orbium*, how much of error, unsound reasoning, and happy conjecture combined to secure for him in all times the association of the system with his name.

De Revolutionibus Orbium, dedicated to pope Paul III., consists of six books, in which Copernicus undertook to demonstrate his whole system. The character of the reasoning which then passed for demonstration, must be borne in mind in judging of the author's procedure in establishing his various positions. It was then thought a sufficient demonstration of a phenomenon to make a supposition, on which its occurrence would be intelligible, without attempting to bring the supposition itself, by an induction of facts, within the truth of nature; many abstract propositions, too, which would now appear to be simply silly, were at that time universally admitted to be of great weight in scientific arguments.

Illustrations of both of these peculiarities may be gleaned from the first of the six books of *De Revolutionibus*. It contains the following propositions: 1. That the universe is spherical. This is established by such arguments, as that the sphere is the most perfect figure, etc. 2. That the earth is spherical, which flows from the same kind of consider-

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ations. 3. That the earth and sea make one globe. 4. That the motions of all the heavenly bodies must be uniform and circular, or compounded of uniform and circular motions. Here, again, we meet with singular reasons. A *simple* body must move circularly, and nothing but circular motion could give periodicity to phenomena. 5. That, supposing the distance of the stars to be immense, there is no reason why the earth should not have a motion round its axis as well as a motion in its orbit. 6. That the sphere of the stars is immensely distant. The proof is fanciful, and shows he had no notion of a universe of stars pervading space. 7 and 8. The ancients were wrong in placing the earth at the center of the universe. The arguments under this head are as imaginary as those which they were designed to refute. The falling of a body to the earth he deduces from the assumption that it is only given to wholes to move circularly, while it is of the nature of parts, separated from their wholes, to move in right lines. That there must be a *centrum mundi*, an entity unknown to modern science, is admitted, the question being as to its position. 9. It is possible for the earth to have several motions. 10. He establishes the order of the planets, and draws a diagram of the system much as it is now represented. It may be observed that, following the old systems, such as the Ptolemaic, he lays down *a sphere* for the fixed stars. (See FIRMAMENT.) It is clear, also, that he had no idea of the motions of the planets other than that they were such as would be caused by their being fixed in immense crystal spheres revolving round the sun.

The most brilliant and valuable part of the *De Revolutionibus* is that in which he explained, for the first time, the variations of the seasons, the precession of the equinoxes, and the stations and retrogradations of the planets. In general, his explanations are right, and perfect as to the general nature of the causes of the phenomena. But Copernicus had neither mathematical nor mechanical knowledge sufficient to enable him to explain more than the mean motions of the solar system. To account for irregularities, he was obliged to introduce a system of epicycles entirely resembling that of Ptolemy. See PTOLEMAIC SYSTEM. This arose from the false notion of his times, that all motions must be compounded of circular ones, with the application of which idea, and with the invention of convenient epicycles, the greater part of the *De Revolutionibus* is occupied. It may further be added, to rectify the vulgar notion regarding the relation of Copernicus to the system of the heavens, that he had no answer to offer to the mechanical objections to his system. Most of them, indeed, were such as could not possibly be met in the then state of mechanical knowledge. One of the commonest was that against the axial motion of the earth, that it was inconsistent with the fact of bodies falling to the points of the earth directly beneath the points from which they are dropped; for this he had no answer, nor could he have, the laws of motion being not yet discovered. Such being the state of the case, the reader will consider whether, when Copernicus wrote that he held the doctrine of the earth's motion as a mere hypothesis, and not as absolutely in fact true, it is more likely that he made a concession to the religious prejudices of his times, or to difficulties surrounding his hypothesis, which he could well appreciate though not overcome.

COPERNI'CIA. See CARNAHUBA PALM.

COPER'NICUS, NICOLAS, an eminent astronomer, was b. at Thorn, in Prussia, 19th Feb., 1473. He was instructed in the Latin and Greek languages at home; afterwards he was sent to the university of Cracow, where he studied philosophy and mathematics, and took the degree of doctor of medicine. He also studied law at Bologna university. His natural bent, however, was towards mathematics, the study of which he pursued with passion through all its branches.

Having become enamored of the study of astronomy, he projected a journey to Rome in his enthusiastic admiration of Regiomontanus, who resided there, and was then the most illustrious of the astronomers. On his arrival he was kindly received by Regiomontanus, whom he soon rivaled in fame. Here his reputation, and the favor of his distinguished friend, led to his being chosen professor of mathematics, which he taught for several years most successfully. After several years he left Rome and returned to his native country, where, having entered into holy orders, we suppose, he obtained through his uncle, the bishop of Warmia, a canonry at Frauenburg, in the enjoyment of which he passed the rest of his life. His working-day, it is said, he divided into three parts—one devoted to the duties of his office, another to giving medical advice gratuitously to the poor, and the third to study.

Soon after his return to Prussia, he began, in his 35th year (1507), to apply his fund of observations and mathematical knowledge to correcting the system of astronomy which then prevailed. The result was his *De Revolutionibus Orbium*, some account of which is given in the previous article. He completed it in 1530, in his 57th year. But though finished at this date, it was twelve years later before he could be persuaded to give his book to the world by his friends, who urged its publication out of regard at once to his fame and the interests of science. Perhaps the strongest motive for his reticence, was the fear of the unpopularity which the work threatened to bring him (for many who had heard of the views it advocated, doubted if these were in harmony with religion), while it is pretty certain that his desire to conciliate the church (which afterwards showed in the case of Galileo what it was capable of in such a matter). led him to

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dedicate his book, when it was published, to pope Paul III. It is related that the first copy of this labor of his life reached him when he was no longer able to enjoy the triumph. An attack of dysentery, followed by paralysis of the right side, had destroyed his memory and obscured his understanding. In this state he lingered several days. The copy, it is said, just arrived a few hours before he died. It was placed in his hands, and he *seemed* to know it! He died 24th May, 1543, aged 70.

Besides the *De Revolutionibus*, may be mentioned among C.'s works a treatise on trigonometry, entitled *De Lateribus et Angulis Triangulorum*, Wittemberg, 1522, 4to; and *Theophylactici Scholastici Simocattæ Epistolæ Morales, Rurales, et Amatoriæ, cum Versione Latina*. He also wrote a work on money, and several MS. treatises from his pen are said to be in the library of the bishopric of Warmia. His life has been written by Gassendi. See also the life by Von Hipler (1873) and Polkovski's *Zywot Kopernika* (Warsaw, 1873).

COPI'AH, a co. in s.w. Mississippi, bounded on the e. by Pearl river, and intersected by the Illinois Central railroad; 760 sq. m.; pop. '90, 30,233, half colored. It is an agricultural region. Co. seat, Hazlehurst.

COPIAPO', a name of various application in the n. of Chili, marking at once a volcano, a river, a district, a village, and a city. 1. The volcano is a peak of the Andes, in lat. 27° 32′ south. 2. The river has a westerly course from the Andes to the Pacific. Its length is about 155 m.; area of basin 4170 sq. m. 3. The district, sometimes reckoned a part of the province of Coquimbo, is rich in silver and copper; but, excepting on the immediate banks of streams, almost valueless for agricultural purposes. 4. The village, known as Port C., stands at the mouth of the river, containing about 1200 inhabitants. 5. The city, built on the river, about 30 m. from the sea, had in 1890 a pop. of about 10,000. It is connected by railway with Caldera, a harbor of the republic.

COPLAND, JAMES, a distinguished physician, b. at Deerness, in the Orkneys, in 1792. After studying medicine at Edinburgh, he traveled on the continent, and subsequently undertook a journey to Africa, to investigate the nature of epidemic diseases prevalent in tropical lands. He settled in London about 1820, and was made a member of the royal college of physicians. In 1822 he undertook the editorship of the *London Medical Repository;* and, being chosen in that year to deliver the annual oration of the London medical association, he in his lecture advanced a new theory of electro-galvanism. His *Outlines of Pathology and Practical Medicine*, in which he especially treated of the ganglionic nerves and their functions, and proposed a new and more simple classification of diseases, appeared in 1822, and the *Elements of Physiology* in 1824. But C.'s most important work was the *Dictionary of Practical Medicine*, four closely printed volumes, to which he devoted the labor of many years. He d. in 1870.

COPLEY, JOHN SINGLETON, the father of the late lord Lyndhurst, and a historical painter of some note, was b. at Boston in the United States, July 3, 1737. In 1774 he came to England, and, after a visit to Italy, settled permanently in London. In 1783 he was elected a member of the royal academy, and died in 1815. C.'s best work is the "Death of Lord Chatham," now in the national collection. Besides it, may be mentioned his "King Charles ordering the Arrest of the Five Members of Parliament," the "Death of Major Pierson," the "Assassination of Buckingham," and "King Charles signing Strafford's Death Warrant." See *Life* by Mrs. Amory (1882).

COPPÉE, FRANÇOIS ÉDOUARD JOACHIM, born in 1842, early gained a reputation as a poet, and in 1866 published a volume of poems entitled, *Le Réliquaire*, which was followed two years later by *Intimités*, and in 1869 by *Poèmes Modernes*. He then wrote several plays, *Le Passant*, produced in 1869; *L'Abandonnée* and *Fais ce que dois*, 1871; *Le Bijou de la Délivrance*, 1872; *Le Luthier de Crémone*, 1877; *Madame de Maintenon*, 1881. For several years M. Coppée was attached to the library of the Senate House, and in 1878 was appointed keeper of the records at the Comédie Française. He was elected to the Académie Française in 1884; made an officer of the legion of honor in 1888; and wrote a tragedy, *For the Crown*, played in New York and London in 1896.

COPPÉE, HENRY, LL.D., b. Ga., 1821; graduated at West Point in 1845; served in the Mexican war, and as assistant professor at the military academy. In 1855 he was professor of English literature and history in the university of Pennsylvania. He published *Elements of Logic; Rhetoric;* and *Grant and his Campaigns;* besides editing a number of eclectic compilations, was president of Lehigh University in 1866–75, and a professor there till his death in 1895.

COPPER is one of the most anciently known metals, and its name is derived from the island of Cyprus, where it was first obtained by the Greeks. In the earlier times C. does not appear to have been employed by itself, but always in admixture with other metals, principally tin, forming what is now called bronze (q.v.). There is every reason to believe, that next to the large quantities of tin which they obtained, one of the great inducements which the Phenicians had in making searches for metals in Great Britain, was the C. which they procured in their workings in Cornwall.

C. is sometimes met with in nature in a state of purity, but generally it is associated with oxygen, water, and carbonic acid, forming the native carbonate of C. or *malachite* ($Cu(OH)_2+CuCO_3$), or with iron and sulphur, forming the native sulphides of C. and

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iron or *C. pyrites*, Cu_2S,Fe_2S_2. In smaller quantity, C. occurs as the oxide, Cu_2O, and sulphate, $CuSO_4$, and in all cases the ore is obtained from fissures or veins in other rocks. The principal yield of C. ore in Great Britain is from the mines in Cornwall, but large supplies are also obtained from Australia, and from Cuba and Chili in South America.

The principal deposits of copper in the United States are on the s. shore of lake Superior, where the metal occurs in mass among conglomerates and sandstones. It is almost wholly in the metallic or native state, running in veins across the strata, associated with spars and crystalline minerals. It is also abundant in beds of rock, and in such places the richest mines are found. In the beds generally the metal is found in small lumps or grains, but masses of pure copper of the weight of many tons have been found. In 1872, a single mine in this region yielded 8000 tons of pure copper, or nearly one-tenth of the production of the whole world. There is evidence that mines in this region were worked long before the arrival of the modern Europeans on this continent. The operations now going on were begun about 1845, and have increased largely from year to year. There are less important mines in Tennessee, Connecticut, New Jersey, Pennsylvania, and North Carolina.

In the extraction of C. from its ores, the metallurgic processes followed are very tedious and complicated, which mainly arises from the difficulty of separating the iron and sulphur from the copper. The general principle which regulates the working-up of the ore is to burn away the sulphur, S, as sulphurous acid, SO_2, and to carry off the iron by means of fluxes in the form of scoriæ or slag. Metallurgists enumerate ten distinct steps in the production of commercially pure copper.

C. (symb. Cu, from Lat. *cuprum*) has the equiv. 31.7—new system, 63.2. It is the only red metal, has the specific gravity 8.78 when cast, and 8.96 when rolled or hammered; fuses at 1996° F. (1091° C.) (Daniell), and at a white heat passes off in vapor, and burns with a green flame. It is very malleable, and can thus be beaten out into thin leaves; is very ductile, so as to admit of being drawn out into thin wires; and its tenacity is only inferior to that of iron. It is a powerful conductor of electricity, and hence is employed in the construction of lightning-conductors, and in telegraph-wires for underground or submarine communication. C. is also employed largely in the sheathing of wooden vessels, and in the coinage. See also ALLOY.

C. forms many compounds. There are two oxides, the black oxide, CuO, and the red oxide, Cu_2O. The latter is employed in coloring glass of a ruby-red tint. The *green rust* which forms on the surface of a copper-sheeted ship, and on C. coins and vessels which lie in moist places for some time, is a carbonate of C., and is due to the carbonic acid and oxygen of the air acting upon the C. in the presence of moisture. It is very poisonous, and hence any barnacles which may attach themselves to the C. sheathing are poisoned. The carbonate of C., under the name of *blue verditer*, is largely prepared and sold as a pigment. The subchloride of C., moistened and exposed to the air, yields the pigment known as *Brunswick green*. There are several compounds obtained by allowing acetic acid to act upon oxide of C., which are commercially called *blue* and *green verdigris*. The sulphate of C., or *blue vitriol*, $CuSO_4 + 5H_2O$, is prepared by dissolving the black oxide in sulphuric acid, and allowing the salt to crystallize out. The crystals are large, and present a fine blue color. It is soluble in water, and is extensively used by the dyer and calico-printer for the production of several blue and green colors. The solution of blue vitriol is also employed in the preservation of timber from dry rot, and it forms a constituent of some writing inks.

Mineralogy.—Native C. is not of very rare occurrence; it is sometimes massive, or in grains, plates, etc.; sometimes crystallized in cubes or octahedrons; sometimes it assumes dendritic and other beautiful forms. Great masses of native C. have been found both in North and South America.—What are called C. ores in commerce, generally consist of the true ore disseminated through rock, and are therefore very variable in productiveness. A C. schist is profitably wrought at Mansfeldt, in Germany, although it yields only one per cent of copper. Among the most plentiful and valuable C. ores is the *C. pyrites* already mentioned, or *yellow C. ore;* but there is a richer ore called *purple C.* or *variegated C.*, or *bornite*, also a compound of sulphur, C., and iron. *Malachite* and *azurite*, both consisting essentially of carbonate of C., are valuable ores; as are some ores which are essentially composed of oxygen and C., particularly *red C. ore* (*cuprite*) and *black C. ore* (*tenorite*). Some ores of C. contain also silver, and some contain arsenic, antimony, etc. *Gray C. ore* is very compound, containing silver, mercury, zinc, antimony, arsenic, iron, and sulphur. *Atacamite*, wrought as an ore of C. in South America, is composed of chloride of C. and hydrochlorate of copper.

Production and Use of Copper in the United States.—Among the aborigines were undoubtedly many skilled coppersmiths, and while implements have been discovered in various localities throughout the United States, it is highly probable that in the process of barter and exchange common among the tribes, the Lake Superior mines were drawn upon, and native copper hammered into shape to suit the requirements of those who used the spear-head, the celt, etc. While the great mass of the copper used by the aborigines was undoubtedly obtained from Lake Superior, a great deal was procured from other sources. This is evidenced by the discoveries in digging the Delaware and Raritan canal in 1832, as well as by discoveries in many other places. There were found during

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the course of the excavations many skeletons of Indians, and encircling the wrist-bones of the great majority were narrow bands of hammered-copper, and frequently large crescent-shaped ornaments, together with spear-heads, celts, and copper beads of a grade of metal entirely unlike the Lake Superior products. While there is no evidence that the North American Indians built furnaces and smelted their ores, as did the natives of Mexico, Central America, Peru, and Chili, yet there is abundant evidence that they reached a high degree of skill in hammering the blocks of copper they had mined. The specimens of their handiwork exist in many shapes, ranging from the spear-head to the finger-ring.

The great consumption of copper in the United States is a remarkable economic feature. In 1895 the world's yield of copper was something over 334,000 tons, of which the United States contributed more than half. As a matter of fact, nearly, if not quite the whole of our product is worked up and used in our own country. Enormous quantities are used in ship-building, in sheathing, and the development of electrical machinery and appliances. For this latter-named industry, an immense demand has been made for copper wire. There is also a wonderful increase in applications to articles the use of which implies a certain degree of comfortable living, as clocks, ornamental hardware, modern household appliances, etc. It would be difficult to estimate how much is shot away yearly in the form of metallic cartridges. Copper wire is especially adapted for service in telegraphy. Iron wire was at first the only kind used in telegraphy, but in the annual report of the Western Union Telegraph Co. for the year ending June 30, 1895, it states that during 12 months 15,748 miles of new wire were constructed, of which over 10,000 miles were of copper. The present policy is to replace the defective iron wire with copper, and this has been made practicable by the processes which have been invented for the manufacture of hard-drawn copper. A similar change in overhead line construction is also taking place in Europe, and the continued extension of the telephone system all over the world will insure a large consumption in hard-drawn copper wire for many years to come. It has great mechanical strength, and, when carefully prepared, is free from those effects of electro-magnetic inertia that so greatly interfere with the flow of electricity through iron wire. Yet copper wire must be treated, as well as handled, very carefully. Flaws, indentations, scratches, etc., have about the same effect on it that diamond scratches have on glass. A continued application of heat must be avoided, as it softens the wire. It is estimated that the electrical speed in a copper wire is three times that in an iron wire, principally on account of its freedom from magneto-electric inertia.

In 1845 there were but 150 tons of the pure metal produced in the United States, of which only 14 tons came from Lake Superior. In 1846 there were 238 tons of the pure metal; but the increase was steady, until in 1895 the total production was shown to reach 70,000 tons. In 1880 the output of copper in the United States was estimated at 172,524 long tons. About 1880 began the discovery and opening of new mines in the Rocky Mountain regions, and with the developments in Arizona, Montana, New Mexico, California, Nevada, Utah, Colorado, Wyoming, and Missouri, the output east of the Mississippi was proportionately greatly decreased. In 1884 the total production was 64,000 tons; in 1885 it reached 74,000, and in 1888 reached 102,000 tons. During these latter years the Lake Superior product equalled about half the total. Lake Superior turns out ingots from native ore unequaled in quality the world over. Arizona produces metal carrying from 92 to 98 per cent. of copper obtained by a single fusion. Montana ships high grades carrying from 25 to 40 per cent. of copper and matte, a furnace product carrying from 55 to 65 per cent. of metal, and in some cases from 40 to 60 ounces of silver to the ton. Montana now leads all the states in producing copper.

The largest continuous mass of copper ore ever taken out of a mine was probably that from the Minnesota mine on Lake Superior in 1857. It was estimated at 420 to 470 tons. The length of the block was 45 feet, its breadth 22 feet, and its greatest thickness 8 feet. Although irregular and ragged in form and thickness, it was pure copper. Another mass, or series of masses, was taken from the Phœnix mine, which aggregated a weight of 600 tons.

The production of copper in the United States during 1895 was 386,453,950 pounds, a gain of 9½ per cent. over 1894, and by far the largest yet recorded. Thus the output continues to display a steady growth, and the increased demand during 1895 raised the price of copper to the highest point known for several years. There was a decrease of about 12 per cent. in the exports of copper for the same year, so that the gain in price was largely due to the heavy domestic demand. In addition to the quantity of metal absorbed directly, from 4,000,000 to 4,500,000 pounds of copper go into bluestone manufacture,

Copper matte is reputed to contain in many instances precious metal of considerable value, but a specification of the amount is not easy to be made. In 1890 the total output of the copper mines of the United States was somewhat more than 226,000,000 pounds.

COPPERAS is the commercial term for the sulphate of iron. See IRON.

COPPERED, COPPERING, in shipbuilding, are terms used in reference to the sheathing applied to the bottom of timber-built ships. The copper so used is in sheets, weighing from 18 to 32 ounces per sq. foot, and usually measuring 48 in. by 14. A layer of felt, paper, or coarse linen, is first applied to the planking; and the copper is nailed

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down upon it. So much of the bottom as is immersed in the water is thus covered. The timbers are by this means protected from mollusks, cirrhopods, and weeds; and consequently the ship can sail quicker than if no such sheathing were applied. Some builders copper their ships up to the load water-line, while others go no higher than the light-load line; there being a difference of opinion whether the intermediate space, sometimes dry and sometimes wet, ought to expose a wood or a copper surface.

COPPERHEAD. A name given by their political opponents during the civil war to those Northern men who openly or covertly sympathized with the South. The name is taken from the "copperhead" snake, which gives no warning before it strikes. The term gained currency in 1863. See PARTY NAMES.

COPPERHEAD, a serpent of the rattlesnake family, exceedingly poisonous. It grows to about a yard in length, is of light copper-color, with transverse bars, and is without rattles. Its bite is dangerous and often fatal. It is called "deaf adder" and "chunk-head."

COPPER INDIGO is an ore of copper found in spheroidal masses, of an indigo-blue color, in Thuringia and Vesuvius, and is very nearly pure sulphuret of copper. Its composition in 100 parts, is: copper, 64½; sulphur, 32½; iron, ½; and lead, 1.

COPPER MINE RIVER—so named, in common with the mountains to the w. of it, from the metallic products of the vicinity—enters a bay of the Arctic ocean about lat. 68° n., and long. 116° west. Its overland discovery by Lieut. Hearne, then of the Hudson's bay company's service, in June, 1771, excited considerable interest, as incontestably proving that the supposed strait of Anian, whatever might be the truth as to its westward terminus, had its eastward outlet, if any, only in the icy sea. The C. R. rises near a feeder of Great Bear lake, which itself is tributary to the Mackenzie—the former of the diverging water-courses taking a vastly shorter route to the coast than the latter. Hence the C. R. is throughout little better than a series of falls and torrents, being thus, even without regard to its isolated position, but little available in itself for navigation.

COPPERPLATE PRINTING. See ENGRAVING.

COPPER-SMELTING. I. The dry process. The ores are sorted according as they contain much or little sulphur, and are mixed by the smelter to produce a mass, (1) that will contain 9 to 14 per cent of copper; (2) that after calcining will melt easily without flux; (3) that when fused will yield a mass containing about 30 per cent of copper; (4) that shall be free from impurities which would cause a low grade of copper. Three or four tons of this mixture are spread about 8 in. thick on the floor of a reverberating furnace. The fire is at first low; as the mass reddens the heat is increased, and the ore is stirred to expose all equally to the flame. The process lasts from 12 to 24 hours, depending on the quantity of silica and sulphur present. The sulphur is burned or volatilized, and the iron and sulphur pyrites are partly changed to oxides. After the calcined ore is removed from the furnace, water is added to assist oxidation, and the mass is stored for fusing. For this process, the calcined ore, with slag and broken bricks from old furnace hearths, is spread upon a reverberating hearth, the furnace is sealed with clay to exclude the air, and the heat is made intense for about 5 hours. The workman removes the slag which floats on the melted mass, and a second charge is usually added, melted, and skimmed; then the metal is run off into a pit of water, where it is granulated, or into molds, and afterwards crushed by machinery.

The processes of calcining and fusing are repeated, the first with moderate heat to consume the sulphur and oxidize the iron; the second with intense heat to remove the oxide of iron with silica in a slag, while the proportion of copper constantly increases. When the iron is mostly removed and the proportion of sulphur is much reduced, the metal is roasted in a current of air for about 24 hours, the mass being kept in a semi-fluid state. The product is a sulphide of copper, Cu_2S, which is at once submitted to another roasting for 24 hours, the product being nearly pure copper, which a subsequent refining fits for the market. The steps of reduction may be understood from the following table:

SUCCESSIVE ANALYSES IN REDUCTION OF COPPER.

Process.	Composition of Product.						Composition of Slag.			
	Copper.	Iron.	Ox. of Iron.	Sulphur.	Silica, etc.	Total.	Silica.	Ox. of Iron.	Ox. of Copper.	Alumina, Lime, etc.
Selected ore.....	12.3	32.7	.....	31.	24.	100				
1. Calcination.....	12.2	22.7	18.5	16.2	30.4	100				
2. Fusion.....	33.7	33.6	.....	29.2	.....	96.5	60.5	28.5		11.
3. Calcination.....	33.	33.	.....	18.	16.	100				
4. Fusion.....	58.8	12.6	.....	20.5	8.1	100	45.	53.	2.	
5. Roasting.....	98.4	.7	.....	.....	.9	100				

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II. The wet process.—The ores are first burned to drive off part of the sulphur, which is utilized in the manufacture of sulphuric acid; about 30 per cent of the weight is removed. The remainder is mixed with about 15 per cent of common salt, and the whole is finely ground between heavy iron rolls. A portion of unburned, or overburned, pyrites is usually added to bring the proportion of sulphur in the mass to the proper standard. The mass is then calcined, the sulphur is oxidized, sodic sulphate is formed, while the chlorine of the salt unites with the copper to form cupric chloride; the hydrochloric acid and other gases evolved are condensed in tall chimneys as "tower water," which is saved for use in the next stage of the process. The calcined ore is washed in tight wooden tanks, with hot water, "tower water," and dilute hydrochloric acid, until all soluble copper is extracted. The solution is conducted into other tanks of wood, containing heaps of old malleable iron, by which the metallic copper is precipitated in a finely divided condition. When a steel blade, thrust into the liquid, is no longer reddened, the process is ended; the tanks are drained, and the copper is separated from the iron by washing with water. This precipitate contains about 80 per cent of copper, which is further purified, as in the dry way. The liquid which contains the copper carries also the lead, silver, or gold which may have been associated with the copper in the ore, and these metals may all be profitably separated. The electrolytic refining of copper, which produces a perfectly pure metal, is beginning to come into use on a small scale, but is too costly, except for special purposes.

CO'PRA, the dried kernel of the cocoa-nut, from which cocoa-nut oil has been expressed. It is much used in India as an ingredient of curries.

COP'ROLITES (from Gr. *kopros*, dung, and *lithos*, a stone) are the fossilied excrements of animals found in the secondary and tertiary strata of the earth's crust. Their true nature was first inferred from their occurrence in the bodies of several species of *ichthyosaurus*, in the region where was situated the intestinal tube. It has been since shown that they are the voidings chiefly of saurians and of sauroid fishes. They often contain portions of scales, bone, teeth, and shells, the indigestible parts of the food on which the animals lived. Occasionally, they may be found exhibiting the spiral twisting and other marks produced by the conformation of the intestinal tube, similar to what is noticed in the excrement of some living fishes. These peculiar markings obtained for them the name, when their true nature was unknown, of "larch-cones" and "bezoar-stones." C. are found to contain a large quantity of phosphate of lime; and as this forms a valuable manure, the deposits containing them have been of late years largely quarried. See illus., OOLITE GROUP, vol. X.

COPS, COPING (Anglo-Sax. *cop*, Germ. *kopf*, the head). The merlons or rising parts of battlements are sometimes called cops, but the term coping is usually applied to the covering course of a wall, which is made either sloping or round, so as to throw off water. Where the coping is of hewn stone, it is frequently ornamented with a circular molding running along the top, and sometimes the angle at the top is simply taken off to prevent it from being chipped.

COPSE, or COPPICE, a natural wood or plantation, of which the trees are cut over from time to time, without being allowed to attain the size of timber trees, sending up new shoots from their roots or stools. Some kinds of trees—as the firs—are incapable of being treated in this manner, refusing to send up new shoots; but many—as the oak, birch, chestnut, ash, elm, maple, alder, hazel, and willow—very readily do so, at least if they have not been allowed to attain too considerable a size before being cut over. C. woods are sometimes planted chiefly to vary and beautify the landscape, but more generally with a view to profit, either owing to great local demand for their produce, or to peculiarities of soil and situation. It often happens that, owing to scantiness of soil or to unfavorable subsoil, oaks and other trees, after growing vigorously for a number of years, are arrested, and remain almost stationary in their growth. In such circumstances, it is advantageous to cut them over early, and to treat the plantation as a C., the former vigor being again manifested in the young shoots, and the land yielding in this way a greater return to its owner. Oak is much planted as C. wood, in consequence of the demand for its bark: in some parts of Herefordshire, the trees are cut over every twelve years; but in the Highlands of Scotland, twenty-five or thirty years are often necessary for sufficient growth, nor is the bark thought to have attained its highest perfection till the stems are of this age. The largest pieces of the wood are used for making wheel-spokes, and for other purposes of timber; the smaller portions for charcoal and firewood. Ash is sometimes planted as C., with a view to the employment of the wood for handles of implements, hurdles, hoops, etc., the wood of the ash, even when very young, being highly valued for strength and elasticity. Chestnut copses are planted in England to supply hop-poles. Hazel is a very common C. wood, being in great demand for making crates, etc. Besides the cultivation of different kinds of willow or osier for basket-making, in which they are cut over annually, some of the species are cultivated as C., and cut every five, six, or seven years, for hoops, crates, etc.; the species which is deemed most suitable of all being *salix caprea*. See WILLOW. In some countries, C. wood is particularly valued for the regular supply of fuel which it affords.

In cutting C. wood, care is taken to dress the stools so that water may not lodge in them and cause them to rot. The size to which the stems are allowed to attain before

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being cut, and the frequency of cutting, differ according to the different kinds, and the uses intended. Stems more than 4 in. thick are generally cut with the saw, but smaller stems with a curved bill, cutting upwards.

COP'TIS, a genus of plants of the natural order *ranunculaceæ*. *C trifoliata* is a native of the n. of Europe, Siberia, Greenland, Iceland, and North America. It grows in swamps. From its long, thread-like, golden-yellow rhizomes, it derives the name of *golden thread*. Its leaves have three wedge-shaped leaflets, and its leafless stems bear each a solitary, rather pretty white flower.

COPTIS. Very similar to the *C. trifoliata*, noticed in the article COPTIS, is *C. teeta*, the *golden thread* of Assam, the root of which has long been in high repute in Assam and neighboring countries. It has come into extensive use in India as a bitter tonic, and is sold at a very high price. Great efficacy is ascribed to it as a tonic for patients beginning to recover; but it is of no value as a febrifuge.

COPTOS, the modern Kobt or Koft, a t. in Egypt, near the right bank of the Nile, 25 m. n.e. of Thebes. It is a place of great antiquity, but its ruins belong to a comparatively late period. After the foundation of the port of Berenice on the Red sea, 266 B.C., its position on the caravan line raised Coptos to great importance; but in 292 A.D., in consequence of joining in rebellion against Diocletian, it was almost destroyed. During a part of the 7th c. it was called Justinianapolis, in honor of the emperor Justinian. Excavations conducted on the site of Coptos by Mr. Flinders Petrie in 1894 brought to light objects of Egyptian art earlier than any previously known to exist.

COPTS, the Christian descendants of the ancient Egyptians. Various derivations have been given of the name, which, however, is most probably from the same root as E-*gypt*. The C. are in number about 150,000, only about a fourteenth of the population of the country. There are about 10,000 of them in Cairo. They are not of great stature, have black eyes and rather curly hair, and in a number of points resemble the ancient Egyptians, from whom also they have inherited the custom of circumcision. They dress like the Moslems, but are generally distinguished by a black turban. Their character is in general gloomy, deceitful, and avaricious. They are very expert in calculations, and are therefore much employed as accountants and book-keepers, by which they have acquired a great influence in the country, filling very important posts. In religion they are generally monophysites (q.v.) of the Jacobite sect; smaller sections of them, however, are united to the Greek and Roman Catholic churches. They ascribe their conversion from heathenism to St. Mark, whom they regard as the first patriarch of Alexandria. Their highest dignitary is the patriarch of Alexandria, whose residence, however, is in Cairo. Their other orders of clergy are bishops, archpriests, priests, deacons, and monks. The patriarch is named by his predecessor from among the monks of the convent of St. Anthony, or chosen from among them by lot. He is not permitted to marry. He nominates the metropolitan of Abyssinia. See ABYSSINIA. There are twelve bishops. The C. are very strict in their religious observances, and hate other Christian sects even more than they hate the Moslems. They baptize by immersion; practice unction, exorcism, and auricular confession; and celebrate the Lord's supper with leavened bread which has been dipped in wine. They keep Friday with great strictness as a fast-day. They have many schools, but only for boys, who learn the Psalms, gospels, and apostolic epistles in Arabic, and the then gospels and epistles in Coptic. The Coptic, however, is not grammatically taught, and is not now a spoken language, having been everywhere supplanted by the Arabic. It has not been spoken in lower Egypt since the 10th c., but lingered for some centuries longer in upper Egypt. It is, however, still used by the C. in their religious services, but the lessons, after being read in Coptic, are explained in Arabic. The Coptic literature consists in great part of lives of saints and homilies, with a few Gnostic works. The alphabet was borrowed from the Greeks at the time of the introduction of Christianity, with the addition of a few letters. There are two principal dialects of the language—the Sahidic or upper Egyptian, and the Memphitic or lower Egyptian, which is sometimes exclusively called Coptic. A third dialect, the Bashmuric, of which only a few remains exist, was spoken in the delta, and is interesting from its points of resemblance to the language of the hieroglyphics.

COP'ULA (Lat. band), is a term employed in logic to designate the word which unites the two notions of a sentence—viz., the subject and predicate into one judgment or thought. Thus, in the sentence, "Art is long," *art* is the subject, *long* the predicate, and *is* the copula. The C. is either expressed apart by some part of the verb "to be," as in the above sentence, or it is contained in the word expressing the predicate—as, "The flower blooms"—i.e., *is* blooming.

COPY, in the fine arts, is a reproduction of a work, whether painting, statue, or engraving, not by the original artist. A C. made by the master himself is called a repetition or replica (in French, a *doublette*). It is said that copies are of three degrees: first, where the original is mechanically imitated in its minutest details (this is always done when an engraving is to be obtained); second, where only the principal traits are imitated; and third, where the general idea merely is borrowed. A C. of a statue, or other piece of sculpture, taken from a mold, is not called a C., but a *cast* (q. v.).

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COPYHOLD, a species of estate or right of property in land in Ireland and England, nearly resembling in many particulars the feu-rights of Scotland. C. is expressed technically as "tenure by copy of court-roll at the will of the lord, according to the custom of the manor." This means, that it is tenure of land, being part of a manor, the title being evidenced by the court-rolls of the manor, and the right of the owner being in conformity with the immemorial customs of the manor. The addition, at the will of the lord," serves only as a memorial of the derivation of this species of estate from the estates granted in old times to the bondsmen, or *villeins* (see SERF), which were of course resumable at the pleasure of the lord. But the will of the lord is now absolutely controlled by the custom of the manor, which forms the law of the tenure; and as this custom must be immemorial, i.e., extending to the reign of Richard II., no C. can now be created.

The custom of each manor may vary in important particulars. In some, the C. lands are held for life only; in some, they descend according to particular rules of their own; in most, however, they descend according to the ordinary rules of succession. But the custom, whatever it may be, cannot be altered by the holder of the C.; he cannot, for instance, entail his land unless the custom warrants him.

An important point, also dependent entirely upon special custom, is the amount of the money-payments due by the copyholder to the lord of the manor. These are divided into the *rents*, an annual payment of the nature of the Scottish feu-duty; *fines*, payments on particular occasions, such as alienation or succession; and *heriots*, or the best piece of personal property, to which, on the death of the copyholder, the lord becomes entitled. As to fines, it may be observed, that the custom may either fix the amount, or it may leave them to beat the pleasure of the lord; but as the courts of law require that all customs, even when indefinite, shall be reasonable, they have fixed the extreme amount that can be exacted at two years' rent of the land.

One practical distinction of much importance, drawn between freehold and C. land, is the mode in which it must be conveyed. An ordinary conveyance is ineffectual in regard to C., and indeed would operate, like other attempts to break through the custom which forms the title, as a forfeiture. The course adopted is almost identical with the Scottish *resignation*. The owner comes to the steward of the manor, and by a symbolical delivery, according as the custom may prescribe, surrenders the land to the lord of the manor, in order that it may be granted again to such person, and on such terms as are desired, and as the custom authorizes. The steward, by a repetition of the symbolical delivery, transfers the C. to the person in question, in terms of the surrender; and he then pays the customary fine, and takes the oath of fealty. This is called conveyance by surrender and admittance. In the case of an heir succeeding, there is no surrender, but there is admittance only upon payment of the customary fine, and it is enforced by a customary penalty. A mortgage is effected by a surrender, upon condition that the money is repaid, and the admittance takes place only in event of failure of payment. A C. may, in like manner, be devised by will, the devisee being admitted on the death of the devisor. A comparison between C. and the Scotch feu will be found in Paterson's *Compendium of English and Scotch Law*, p. 57.

The inconveniences and loss accruing through the variety of customs to which C. lands are subject, have led the legislature to make provision for their gradual extinction. By the copyhold commissioners, all the services due to the lord of the manor may be commuted for a fixed rent. The lord of every manor is also authorized to enfranchise, or convert into freehold, the C. lands by agreement with their owners. And after the next admittance subsequent to 1st July, 1853, either the lord or the tenant so admitted may compel enfranchisement on payment, either of a fixed sum, where it is at the instance of the lord, or of an annual rent, where it is at the instance of the tenant, fixed in both cases by the commissioners.

COPYING, a term applied in photography to the reproduction of paintings, engravings, manuscripts, maps, etc. The kinds of camera and lens most suitable for the purpose, will be found described under their respective heads; the quality and condition of chemicals necessary are based upon the facts, that long exposure is almost invariably required, and that, in the majority of cases, it is desired to copy black marks upon a white ground, as in a sheet of music, for example. Where it is obvious that nothing that can be called a middle tint is required, but simply pure black and white, recourse should be had to organic matter in the bath; a little acetate of soda, and an extra amount of acetic acid, may be also added, and an old collodion containing free iodine employed.

It is important that the work or surface to be copied should be placed in a strong light, and exactly at right angles to the axis of the lens, which should be furnished with a *small* stop. These three conditions, it will be seen, are such as are calculated to insure density in the blacks of the negative, freedom from distortion, and sharpness at the edges of the picture. The copying of oil-paintings seems to the amateur, at first sight, to present almost insuperable difficulties, on account of the reflected light from the varnish passing through the lens, and producing black patches on the negative. This may, however, be completely avoided by the employment of a lens of long focus, which admits of the oblique pencils of light passing off without entering the camera.

Attention to the laws of the reflection of light, will suggest to the reader the impor-

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tance also of avoiding a bright light immediately behind the camera, as the rays of light would then fall on the varnished surface, nearly at right angles, and be reflected into the camera. The oil-painting, therefore, though placed in strong sunshine, for the purpose of giving vigor to the more obscure parts, should be so arranged as to allow the light to fall on it at an angle of about 35° or 40°.

In copying transparent negatives, a somewhat different arrangement is required, as will appear from considering the following facts. Every object to be copied may be regarded, for the sake of illustration, as an assemblage of bright points, from each of which divergent pencils of rays are reflected, and suffer refraction on passing through the lens; an engraving or oil-painting is, in fact, in its relation to the sensitive surface, the *source of light*. In a negative, however, many of the parts of which are transparent glass, it is manifest the case is different, for if we suppose the sun or a luminous background to be placed behind the negative, *that* will act as the source of light, and any rays coming therefrom will pass almost directly through those parts of the negative which are bare glass, to the lens; thus producing the same effect as if the transparent parts were opaque, but luminous, and emitted divergent pencils of light. It is necessary, therefore, that the rays should be made to intersect at those points where bare glass exists, and this may be accomplished by employing what is called a condensing lens, by which means negatives may be most successfully copied, by placing an artificial light behind it, or still better, by reflected sunshine through it.

Negatives are sometimes copied on glass by direct superposition in the ordinary pressure-frame, such as is used for printing photographs on paper, in which case, dry plates are used, prepared either by the albumen or collodio-albumen process; and the latent image so obtained yields a transparent positive when developed by gallic or pyrogallic acid.

COPYING-MACHINES. The various contrivances for procuring duplicates of writings without the labor of transcribing them, may be reduced to two classes. In the one, the writing is first made, and then copied; in the other, the copy and the original are produced at the same time. The essence of the first method is this: In writing the original, an ink is used that is made for the purpose, or common ink thickened by the addition of a little sugar. When the writing is dry, a damped sheet of thin unsized paper is laid upon it, and over this a piece of oiled paper. The whole is then subjected to pressure, and the damped paper is found to have taken off an impression of the writing. It is of course the reverse of the original, but the nature of the paper allows it to be read right on the other side. The machines for communicating the pressure are of various kinds. Some pass the sheets between rollers like the copper-plate press; others act on the principle of the common printing-press. A simple plan is to wrap the sheets round a wooden roller of about an inch diameter, lay this upon a table, and roll it under a flat board, pressing all the while. Another very common method of copying, is by means of prepared blackened paper laid between two sheets of thin writing-paper. The writing is traced firmly on the upper sheet, with a steel or agate point, or common black-lead pencil, and the lines are found transferred in black from the blackened sheet to the paper adjacent. By having several of these blackened leaves, a number of copies may be produced at once. The blackened paper is prepared by saturating it with a mixture of lard and lamp-black.

The following may be mentioned: 1. *The Electric Pen*, invented by Thomas A. Edison. This is a metallic tube or style within which vibrates longitudinally a steel wire, pointed and protruding slightly at the lower end. The vibration is caused by an engine carried at the top of the style. Several motive powers are applicable, as compressed air, water, force communicated from other machinery, etc.; but as the most convenient and portable, Mr. Edison chose an electro-magnetic engine, actuated by a current brought from a small battery which stands on the table by the side of the writer. The engine having been started, and the wire vibrating at a rapid rate, the style is held vertically over the paper, and the point is moved upon the sheet as in the act of writing. The needle punctures a series of holes in the path over which the pen is carried, and the paper becomes a stencil, in which the writing readily appears when the sheet is held up to the light. This stencil is then laid upon a sheet of plain paper, in a frame which binds the two together; an inked roller is passed over it, and the ink pressed through the holes in the stencil appears upon the clean sheet in a series of minute dots in the line of the writing. With careful use a stencil will furnish 500 or more copies. After some copies have been taken, the stencil may be dried and kept for use again.

2. *The Papyrograph.* The patentee furnishes a specially prepared paper, upon which words are written with a common pen, but with a special ink. The sheet is then soaked in water, and the ink corrodes the fabric of the wet paper, leaving open lines in place of the writing. The sheet is then used as a stencil, like that prepared by the electric pen.

3. *The Gelatine Pad.* A simple, cheap, and effective copier may be prepared thus: Procure a shallow tin pan, one half an inch deep, and a little larger than a common cap or letter sheet. Soften 3 oz of gelatine, white glue, or even common glue, by soaking

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in cold water, and remove all the unabsorbed water. Boil for 1 hour in 10 oz. of glycerine, over a salt-water bath, and pour into the pan; when cold it is ready for use. In warm weather a larger proportion of glue is desirable. A special ink is necessary. Boil 1 oz. of violet aniline in 7 oz. of water; when cold, add 1 oz. of alcohol, ½ oz. of ether, ½ oz. of glycerine, and 2 or 3 drops of weak carbolic acid. If this ink dries too quickly in the pen, add a few drops of alcohol. A good ink is made by dissolving 2 oz. of citric acid in 6 oz. of water, to which add 1 oz. of violet aniline. The writing to be copied is laid face downward upon the pad, and lifted again after a moment's delay, when a copy appears in reverse upon the jelly. A clean sheet laid upon this negative and instantly removed, shows a fac-simile of the original. Success depends much upon the quality and consistency of the ink. Ink made with black aniline will give about ten copies; with green, 30; with red, 60; and with violet aniline 100 to 125 fair copies have been taken. As soon as the copying is finished, the pad should be washed, using a soft sponge and clear water, warm preferred. The action of the pad is thus explained: The glue does not unite with the glycerine, but forms a spongy mass whose minute pores are occupied with the fluid. The aniline ink is absorbed by the glycerine and given up successively to the sheets of paper, as they are laid down. Repeated washings wear away the pad. If its surface becomes injured it may be remelted, and more material added, at pleasure. Pads of this nature, made from various recipes, are sold under different names, but the materials and methods of use are substantially as described.

4. *The Blue Process* is peculiarly adapted to the reproduction of drawings, and is useful to architects, engineers, and artificers. Two solutions are prepared: the first contains one part of citrate of iron in four parts of pure water; the second contains one part of red prussiate of potash in six parts of water. When ready for use, equal parts of the solutions may be mixed in a shallow dish, and applied to sheets of paper with a sponge or a camel's hair pencil Any paper will serve, but that is best which has but little sizing. The solution should be applied, and the paper should be dried and kept in the dark. The solutions themselves will keep, separately, in the dark as long as desired, but if mixed soon begin to deteriorate. The drawing or writing to be copied should be made with very black ink, upon paper or tracing cloth. A photographer's glazed frame, having a back easily removed, is useful for copying. Place the drawing face down upon the glass; the prepared paper with its face against the back of the drawing; put the movable back in place, reverse the frame, and expose to light. In direct sunshine, 2 to 7 minutes will be long enough, the time to be ascertained by trial; in diffused light, the exposure must be 5 to 10 times as long. After exposure the print should be immediately washed in a tub of clear water; when the chemicals are removed, the sheet is fastened by its corners to a line to dry, and the surface may be afterward finished by a hot iron, or by pressure. A little practice may be needed to secure the best results, in which the lines will be clear white, and the background a deep blue. A light blue background indicates a weak solution, or insufficient exposure; over-exposure is shown by a grayish tint. Clear, quick sunshine will give sharper lines than can be obtained by slow diffused light. The chemical change is evident; the light causes a reaction between the prussiate of potash and the iron, of which Prussian blue is the product; this occurs wherever the light has not been intercepted by the black lines of the drawing, which therefore appear in white upon an intensely blue and unfading background. Copies may be multiplied at will from negatives in collodion on glass, from engravings in books, from drawings, or from manuscript. See MIMEOGRAPH.

COPYRIGHT, an author's exclusive right of property in any work which he writes, and which, under certain limitations, is transferable to his heirs and assigns. Such is the chief or general meaning of the term, which now, however, embraces several varieties of right; and these, from the importance of the subject, we propose to consider separately.

English.—The idea of a right of property in literary composition is of modern origin. Nothing is heard of C. previous to the invention of printing, nor for a long time afterwards. In ancient and mediæval times, books appear to have been transcribed freely by other parties than their authors, and as freely disposed of, often at great prices. After the introduction of printing, the liberty to publish books became the subject of licenses and patents; and these privileges may be said to have constituted a special monopoly of the nature of copyright. In the absence of any license or protection of this kind, authors could only resort to the common law to vindicate their real or fancied rights. But the common law of England was silent on the subject. There were serious differences of opinion among lawyers as to the availableness of an exclusive right in literary composition, viewing it as a chattel or thing that could be held, inherited, or assigned. How, it was asked, could ideas, or the way of writing a narrative, be made property? Supposing, however, that a certain structure of ideas and written words could be invested with the quality of property, it was reasonable to conclude that the property should be absolute and perpetual to the owner, his heirs and successors. Such being the case, it would be proper for the heirs of Shakespeare, Milton, Bunyan, and other literary luminaries of past times, to claim possession of the works of their respective ancestors; leaving them, of course, the right either to maintain a monopoly, or to suppress the works altogether. Such were the questions that puzzled the English

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jurists of the early part of the 18th century. A compromise appears to have been made. No decision was come to as to whether literary composition was property in the ordinary sense of the word. Yet, looking at it as a thing on which thought and labor had been expended, and professedly "for the encouragement of learning," it was deemed worthy of legal protection for at least a period limited by considerations of public policy. An act of parliament was according passed on the subject in 1709.*

This, the first C. act, 8 Anne, c. 19, sets out as follows: "Whereas printers, booksellers, and other persons have of late frequently taken the liberty of printing, reprinting, and publishing, or causing to be printed, reprinted, and published, books and other writings, without the consent of the authors or proprietors of such books and writings, to their very great detriment, and too often to the ruin of them and their families: for preventing, therefore, such practices for the future, and for the encouragement of learned men to compose and write useful books, may it," etc. The chief provisions of the act were, (1.) That authors who, after April 10, 1710, had not sold their C. of works in print, were to have the sole right of printing them for 21 years; (2.) Authors of books not printed and published, and their assignee or assigns, to have the sole liberty of printing and reprinting such book and books for the term of 14 years, to commence from the day of the first publishing the same; (3.) After the expiration of the said term of 14 years, the sole right of printing or disposing of copies to return to the authors, if they were then living, for another term of 14 years.

Under this act, authors disposed of the C. of their works for the specified period, at the end of which, 28 years at most, the C. lapsed. Although the works might then have been considered public property, a custom arose among publishers of not interfering with each other's lapsed copyrights; and in a sense each assumed a kind of perpetual monopoly of the works which he had purchased for a terminable period. So stood matters, when Alexander Donaldson, an Edinburgh book-seller, of whom some notice has been taken in the article BOOK-TRADE, broke through the conventional regulations, by issuing cheap reprints of works out of copyright. There ensued a litigation, of which it is necessary to present some details. At divers times in 1729, James Thomson sold the C. of his *Seasons* and other poems to Andrew Millar, a London book seller, for sums amounting to £242 10*s*. Thomson died in 1748. According to the act 8 Anne, c. 19, the utmost length to which the C. of these works could be extended was 28 years, which terminated in 1757. Millar died in 1768, and his executors, in 1769, sold by auction the C. of the works in question for £505. The purchasers were "Beckett and others." This sale was, in reality, an imposition; for, as just mentioned, the C. had expired in 1757. Aware of this fact, Donaldson, in 1768, issued a cheap edition of Thomson's *Seasons*. He was now challenged for an invasion of C.; and in 1771, Beckett and others applied for, and procured, an injunction from the court of chancery to restrain him from further printing and selling the work, and to make him answerable for the profits he had already realized. The only explanation of this extraordinary proceeding is, that the applicants for the injunction imagined that at common law they had acquired a property in Thomson's *Seasons* in all time coming. The question at issue was nothing less than the creation of perpetual monopolies in literature—not for the benefit of authors and their families, but for certain publishers and their assigns. The notion of a common-law right had prevailed in granting the injunction, and the validity of such a notion was now forever to be determined. Donaldson appealed to the house of lords. The chief points pressed for consideration were, whether at common law an author had the sole right of printing his works, and whether, possessing a right of that kind, it was taken away by the statute 8 Anne, c. 19. The lords differed in their opinion, but the decision finally come to was, that any right at common law was impeached and taken away by the statute; and the decree of the court of chancery was accordingly reversed. See Brown's *Parliamentary Cases*, vol. ii. p. 136 By this famed decision, it was settled that claims of C. rest altogether on the statute and its interpretations. Ever since, any one is at liberty to print and sell works of which the statutory term of C. has expired; on the simple ground, that all such works are public property.

The C. law did not extend to Ireland till after the union with that country, when (1801) the whole United Kingdom was included by the act 41 Geo. III. c. 107. Previous to this time, many of the most salable of the British C. works were freely reprinted in Dublin, and occasionally found their way across the channel to the annoyance of English authors and publishers. The next act concerning copyrights was that of 54 Geo. III. c.

* Until this act came into operation, the law of Scotland, as regards copyright, had been as defective as that of England. Under date Nov. 9, 1699, the following occurs in the *Domestic Annals of Scotland*, by R. Chambers, vol. iii.: "It was customary for the lords of privy council to grant exclusive right to print and vend books for certain terms—being all that then existed as equivalent to our modern idea of copyright. Most generally, this right was given to book sellers and printers, and bore reference rather to the mercantile venture involved in the expense of producing the book, than to any idea of a reward for authorcraft. Quite in conformity with this old view of literary rights, the council now conferred on George Mossman, stationer in Edinburgh, 'warrant to print and sell the works of the learned Mr. George Buchanan, in one volume in folio, or by parts in lesser volumes,' and discharged 'all others to print, import, or sell, the whole or any part of the said Mr. George his works in any volume or character, for the space of nineteen years.'" Some other instances of the same kind are given, making it clear that in these times books could not be printed in Scotland without authority from the privy council.

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156, in 1814, by which the period of C., instead of being 14 years, and contingently for 14 years more, was fixed to be 28 years certain, and for the residue of an author's life, if he were living at the end of the 28 years.

The impetus given to literature during the early part of the present century, by the popular and voluminous writings of Scott, Byron, Moore, Wordsworth, and others, along with the growing taste for reading among the middle and less affluent classes, greatly increased the market value of C. in every species of literary production. As a natural consequence, that kind of disinterestedness so strikingly demonstrated in Robert Burns, who could hardly be prevailed on to accept a few pounds complimentarily in requital for hundreds of the most beautiful lyrics, was no longer seen, on the contrary, it became a recognized principle that an author was entitled to regard the product of his brain as purely a mercantile commodity. At length, under an impulse communicated by the assigns of some valuable copyrights about to expire, and on the assumption of benefiting the families of certain popular writers, the legislature was induced to extend the term of copyright.

By the act 5 and 6 Vict. c. 45, called Talfourd's or lord Mahon's act, 1st July, 1842, the term of C. was extended as follows: "And be it enacted that the copyright in every book which shall after the passing of this act be published in the life-time of its author shall endure for the natural life of such author, and for the further term of seven years, commencing at the time of his death, and shall be the property of such author and his assigns: provided always, that if the said term of seven years shall expire before the end of 42 years from the first publication of such book, the copyright shall in that case endure for such period of 42 years; and that the copyright in every book which shall be published after the death of its author shall endure for the term of 42 years from the first publication thereof, and shall be the property of the proprietor of the author's manuscript from which such books shall be first published, and his assigns." In the case of subsisting copyrights, the term was to be extended to 42 years, except when they belonged to an assignee for other consideration than natural love and affection; in which case they were to cease at the expiration of the 28 years, unless their extension were agreed to between the proprietor and author. In this act, there is a remarkable clause giving power to the judicial committee of the privy council to license the publication of books of importance, which the proprietor refuses to republish after the death of the author. Formerly, there was an obligation on publishers to deliver 11 copies of new works to certain universities and other public institutions; the obligation was now modified to five copies. The importation of English C. works printed in foreign countries is prohibited. C. is declared to be personal property, and may be bequeathed as such; in case of intestacy, it is to be subject to the same law of distribution as other personal or movable estate. The old obligation to register the C. of new works at stationers' hall was also modified; registration is no longer obligatory, but the practice of registering is still requisite for the sake of evidence in making good claims of copyright. Forms of registration and assignment are given by the act, but the use of them is not indispensable. The law of C. makes no distinction between British subjects and aliens. A foreigner may own the C. of a work printed first in Great Britain; but neither he nor any other person could maintain a claim of C. in a work which had been previously issued in a foreign country with which there is no international treaty of copyright. Attempts are sometimes made to evade this, by issuing editions of a work simultaneously in the United States and England on the same day, so as to secure both British and American copyrights.

The ordinary process of stopping the issue of unauthorized reprints of C. works, which receive the name of pirated editions, consists, in the first place, in procuring an injunction from the court of chancery (if in Scotland, an interdict from the court of session), and of afterwards raising an action of damages at common law. On all that concerns prosecution, as well as for many details respecting C. in its different varieties, we refer to Godson and Burke's *Treatise on the Law of Copyright.*

In the United States copyright has no application to unpublished literary or artistic productions. For, although the word "property" conveyed to the student of the early common law a notion of substantial, tangible objects only, yet it is now thoroughly well settled that intellectual productions are as truly property as are material substance, and that they are equally entitled to protection. This property right in thoughts and ideas may be separate and distinct from the paper or other substance upon which they are set forth. Thus, the person to whom a letter is sent owns the paper upon which it is written; but the general property in the thoughts expressed, and the rights and privileges incident thereto, belong to the author. In these the receiver has only a qualified interest, as bailee or trustee, and he cannot publish them except by permission, or when it is necessary for him to do so for his own protection, or in support of his rights or character. It has been a much mooted question as to whether the common law regarded this property right in the author of literary or artistic productions as perpetual and upheld it after publication as well as before. In England this question was decided in the year 1764, by Lord Mansfield, in the affirmative. But ten years subsequently the House of Lords overruled that decision and held that publication by the author amounts to a dedication to the public and terminates his exclusive ownership. This latter doctrine was early approved by the Supreme Court of the United States and is now regarded as settled law. When, therefore, the author or proprietor of literary or artistic property

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desires to publish his work to the world, he must look elsewhere than to the common law for continued protection to his rights. He finds it, for a limited period, in the statutes which grant him a copyright.

Such statutes exist in most civilized countries. Thus, the right is granted in France during the lives of the author and his widow and to the children for 20 years longer; in Germany during the life of the author and 20 years after his death; in Greece for 15 years from the date of publication, and in Russia, during the author's life and to his assigns for 25 years and for 10 years thereafter, if they publish an edition within 5 years before the expiration of the first term. The first English copyright act was passed in 1709 (8 Anne, ch. 19), and went into operation in 1710. By complying with its requirements an author obtained a copyright which lasted for 21 years. The impetus given to literature at the beginning of the present century, and especially the popularity obtained by the works of Scott and Byron, gave increased value to copyright, and led to further legislation, and finally to the act of 1842 (5 and 6 Vict.), which, as amended in 1862 (25 and 26 Vict.) is now the law of England upon this subject. This law affords to an author and his representatives, during his life and 10 years thereafter, or for the definite period of 42 years, whichever term is the longer, the sole right to publish, circulate, and sell his books, maps, charts, pamphlets, magazines, lectures, engravings, prints, dramatic and musical compositions, paintings, drawings, photographs, models, busts, and designs. It also grants to dramatic and musical composers the exclusive right, for the same periods, to perform their compositions or represent their pieces. In the United States, the entire power to legislate upon copyrights is vested in Congress. The first law upon the subject was passed in 1790. It fixed the life of the right at 14 years, and granted the privilege of one renewal for a like term. By the general copyright act of 1832, the time was extended to 28 years, with the right of renewal for 14 years more. The same periods are retained in the act passed in 1870, which repealed all prior copyright laws and is the statute now regulating the subject in this country. (U.S.R.S. § 4948–4972.) It provides that "any citizen of the United States, or any resident therein, who shall be the author, inventor, designer, or proprietor of any book, map, chart, dramatic or musical composition, engraving, cut, print, or photograph or negative thereof, or of a painting, drawing, chromo, statue, statuary, and of models or designs intended to be perfected as works of the fine arts, and the executors, administrators, or assigns of any such person, shall," upon complying with the provisions of the act, "have the sole liberty of printing, reprinting, publishing, completing, copying, executing, finishing, and vending the same; and in the case of a dramatic composition, of publicly performing or representing it, or causing it to be performed or represented by others." The word "book" does not require any prescribed length of composition; a single page or any number of pages can be copyrighted as a book. The production need not conform to any standard of literary merit, nor need it be strictly original. But it must contain some independent work and must not consist of indecent, libelous, or scandalous matter, nor tend to disturb the peace or corrupt public morals. An abridgment, containing no new material whatever, but displaying originality in the design and execution of the work, may be copyrighted, and the same is true of reviews of a book making copious quotations therefrom, yet marked by independent thought and labor. So dictionaries, books of chronology or genealogy, compilations, tables, charts, abstracts of title, etc., are proper subjects for copyright. But the right will not be granted for the protection of a "price current," of labels upon bottles, or of advertisements as such, since these are not books. Neither will books first published in foreign countries nor their reproductions in the United States be protected. But new matter contained in such works may be properly copyrighted. Newspapers are not protected by the copyright laws of either England or America. But specific articles published in such papers come within the scope of those laws. Besides the requirement as to originality, a production, in order to be copyrighted, must not have been previously published or dedicated to the public nor used *ad libitum* by people generally so long as to be regarded as abandoned by the author.

Until 1891, only a citizen or resident of the country could obtain a copyright in the United States; and it was also requisite that the work, with the exception of paintings, drawings, chromos, statues, statuary, models, and designs, should be the *production* of a citizen or of a resident. Residence, as used by the statute means about the same as domicile, i.e., actual bodily presence in the United States with intent to remain there as a permanent abode. But no formal declaration as to intended permanent residence is necessary, nor is any fixed or definite period of actual residence. The question is one to be determined from the intention and acts of the applicant for a copyright. The exclusion of non-resident foreigners from the privilege of copyright in England is the result of quite recent judicial determination. It was not until the year 1854 that it was finally settled by the House of Lords, that no foreigner, resident abroad, can obtain a copyright in England, nor confer, by assignment, a valid title to obtain one upon an English subject. The requirements as to residence, however, are not so strict in England as in the United States. A temporary sojourn by the author within the British dominion, during the publication of the work, is sufficient. And even this, of course, is not required of a British subject. The publication, however, must be within the United Kingdom, and it must be published there for the first time. It may be published elsewhere contemporaneously with its publication in England, but a prior publication elsewhere will defeat

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the English copyright. As a result of these rules, it was quite customary for American authors temporarily to reside in Canada during the publication of their works in England, and thus to obtain a valid English copyright. The matter of international copyright has, of late years, received much attention in the United States, but until 1891, no law on the subject was actually enacted, though the agitation in favor of such a statute was agitated as early as 1837, when Henry Clay brought the matter before congress on petitions from the leading authors of Great Britain and America. But the great body of the publishing trade in the United States was opposed to it; they found a vigorous advocate in Henry C. Carey, of Philadelphia, and the subject was dropped. Rufus Choate in 1843, Charles Sumner in 1852 and 1866, E. Joy Morris, 1858–60, and Mr. John P. Baldwin in 1868, appeared as champions of the measure, but were unable to overcome the apathy of Congress. In 1872–73 a committee of American authors and publishers gave assent to the proposal of Mr. W. H. Appleton, to extend the privileges of copyright to foreign authors, provided that the reprints or translations of their works were manufactured in this country. A bill to this effect was referred to the senate committee on the library, but advanced no further. Meanwhile, a system had been growing up among the leading American publishers, the result of many mutual invasions and reprisals, which secured to foreign authors most of the advantages of copyright. This was known as the "trade courtesy" rule, and it provided that whenever one house advertised the fact that it had made arrangements with the British author or publisher for the reproduction of his book, the other houses were to refrain from publishing that book. Under this system publishers could afford to pay high prices for advance sheets of foreign books. But beginning in 1876 a class of publishers sprang up who saw no reason to regard the courtesy rules, and who reprinted current foreign works in a cheap style. These cheap republications so cut into the regular market of the authorized publishers, that the latter could no longer continue making adequate remuneration to foreign authors. In 1878 Messrs. Harper & Bros. addressed a letter to the secretary of state, suggesting the passage of an international copyright treaty between the United States and Great Britain. The suggestion was heartily favored by the leading publishers of Boston, New York, and Philadelphia; but, after a vigorous canvass of the matter, they found it impossible to unite with their British brethren on any agreement in regard to the question of remanufacture as an essential condition for the granting of copyright, and the negotiations came to an abrupt close. Nevertheless in 1884 a large proportion of the American publishers signified their approval of the bill framed by Mr. Dorsheimer, representative in Congress from New York, which, waiving altogether the question of remanufacture, provided that whenever any foreign government should accord to American authors the same rights that their own have, then by executive proclamation authors of that nation should have the benefit of our laws. This is substantially the system of England and other European nations. But though the bill was favorably reported by the judiciary committee of the house, and was well supported by the press and the public, questions of more general interest caused it to be delayed and lost. In Jan., 1886, a bill to effect international copyright was introduced into the senate by senator Chace, of Rhode Island; was reported anew in Dec., 1887, and after several amendments was passed by that body, May 10, 1888; but, though favorably reported by the judiciary committee of the house no further action was taken during the session of the 1th congress.

A vigorous agitation was carried on, however, by the American Copyright League, of which Mr. James Russell Lowell was the president and Mr. Robert Underwood Johnson, secretary, and, in February, 1891, a bill finally passed both houses of Congress and was signed by President Harrison. The important sections of the bill read as follows:

Sec. 3. No person shall be entitled to a copyright unless he shall, on or before the day of publication in this or any foreign country, deliver at the office of the Librarian of Congress, or deposit in the mail within the United States, addressed to the Librarian of Congress at Washington, District of Columbia, a printed copy of the title of the book, map, chart, dramatic, or musical composition, engraving, cut, print, photograph, or chromo, or a description of the painting, drawing, statue, statuary, or a model or design for a work of the fine arts, for which he desires a copyright, nor unless he shall also, not later than the day of the publication thereof in this or any foreign country, deliver at the office of the Librarian of Congress at Washington, District of Columbia, or deposit in the mail within the United States, addressed to the Librarian of Congress at Washington, District of Columbia, two copies of such copyright book, map, chart, dramatic, or musical composition, engraving, chromo, cut, print, or photograph, or in case of a painting, drawing, statue, statuary, model, or design for a work of the fine arts, a photograph of same; provided, that in the case of a book, photograph, chromo, or lithograph, the two copies of the same required to be delivered or deposited as above shall be printed from type set within the limits of the United States, or from plates made therefrom, or from negatives or drawings on stone made within the limits of the United States, or from transfers made therefrom, and the depositing of two copies of such book, as provided by this act, shall, contrary to the provisions of this act, within the term limited, and without the consent of the proprietor of a copyright, first obtained in

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writing, signed in presence of two or more witnesses, print, publish, dramatize, translate, or import, or, knowing the same to be so printed, published, dramatized, translated, or imported, shall sell or expose to sale, any copy of such book, shall forfeit every copy thereof to such proprietor, and shall also forfeit and pay such damages as may be recovered in a civil action by such proprietor in any court of competent jurisdiction.

Sec. 12. That this act shall go into effect on the 1st day of July, A.D 1891.

Sec. 13. That this act shall only apply to a citizen or subject of a foreign state or nation when such foreign state or nation permits to citizens of the United States of America the benefit of copyright on substantially the same basis as its own citizens, or when such foreign state or nation is a party to an international agreement which provides for reciprocity in the granting of copyright, by the terms of which agreement the United States of America may at its pleasure become a party to such an agreement. The existence of either of the conditions aforesaid shall be determined by the President of the United States by proclamation made from time to time as the purposes of this act may require. During the existence of such copyright, the importation into the United States of any book, chromo, lithograph, or photograph so copyrighted, or any edition or editions thereof, or any plates of the same not made from type set, negatives or drawings on stone made within the limits of the United States, shall be, and it is hereby prohibited, except in the cases specified in paragraphs 512 to 516 inclusive, in section 2 of the act entitled "An act to reduce the revenue and equalize the duties on imports, and for other purposes," approved October 1, 1890; and except in the case of persons purchasing for use and not for sale, who import subject to the duty thereon not more than two copies of such book at any one time; and except in the case of newspapers and magazines not containing in whole or in part matter copyrighted under the provision of this act, unauthorized by the author, which are hereby exempted from prohibition of importation; provided, nevertheless, that in the cases of books in foreign languages of which only translations in English are copyrighted, the prohibition of importation shall apply only to the translation of the same, and the importation of the books in the original language shall be permitted.

Prior to the statute of 1891, a copyright was obtained in the United States by depositing a printed copy of the title of the work in the clerk's office of the District Court, in the district where the author or proprietor resided. By the act of 1870, three requisites are prescribed: 1. A printed copy of the title of the book or other article, or a description of the painting, drawing, chromo, statue, statuary, model or design must be delivered at the office of the Librarian of Congress or deposited in the mail addressed to him. 2. Within ten days after publication, two copies of such book or other article, or in case of a painting, etc., a photograph thereof, must be delivered at the office of the Librarian of Congress, or deposited in the mail addressed to him. Failure to comply with this requirement does not invalidate the copyright, but renders the author or proprietor liable to a fine of $25. 3. Notice of the copyright must be given, by inscribing upon the title-page, or the page immediately following it, in every copy of every edition of a book, or upon other articles, on the face thereof, or of the substance on which it is mounted, the words: "Entered according to act of Congress, in the year — by — in the office of the Librarian of Congress at Washington." Failure to comply with this requirement precludes all actions for infringement. An assignee is protected by a copyright, effected upon the work before the assignment, but in order that he may claim such protection against purchasers or mortgagees of the article for value and without notice, the assignment must be recorded, within 60 days after made, in the office of the Librarian of Congress. An assignee of an unpublished work may, under the conditions as to residence, obtain a copyright thereon.

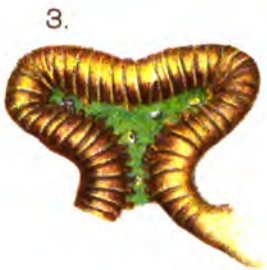
An infringement of a copyright consists in unlawfully printing, publishing, selling, or otherwise appropriating an article, the copyright of which belongs to another. Any appropriation which materially diminishes the value of the original is an infringement. Fair use of a book, such as a *bona fide* review, compilation or translation, is not prohibited. But the right to translate, to dramatize, etc., may be reserved by the author or proprietor. Publication or presentation of a play or dramatic composition, as obtained by stenographic or phonographic reports, or any surreptitious means, while it is being produced upon the stage, is an infringement. But it has been held, though with recent weighty dissent, that any one may publish or perform so much of such a work as he can reproduce from memory. Severe penalties for infringements are prescribed by the statutes, and the person whose right is violated may have an injunction to prevent further injury. See BOOK-TRADE.

COQUELIN, BENOIT CONSTANT, b. Boulogne, France, 1841; entered the Paris conservatory of music and declamation, 1859, where he took the second prize of comedy. He made his first appearance at the Théâtre Français, 1860, and soon rose to be the greatest popular favorite among all the French actors. He has shown marvelous versatility, has distinguished himself not only in the old comedies, but also in the modern Parisian drama, and is a master of both the humorous and the pathetic. He occasionally appears as a lecturer, and several of his lectures have had success in book form. One of these, *L'Art et le Comédien*, has been translated into English as *The Actor and his Art*. He visited the U. S. in 1888 and 1893–94.

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1. Caulastraea furcata; 2. Tridacophyllia pæonia;
3. Mæandrina tenuis.

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Phyllastraea tubifex ; a, animal, partly expanded.

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COQUÉREL, ATHANASE LAURENT CHARLES, a minister of the reformed church in Paris, and one of the most celebrated pulpit orators of France. He was b. in Paris in 1795, and studied theology at Montauban. Afterwards, he became minister of the French church in Amsterdam, where he remained 12 years. In 1830, Cuvier induced him to return to Paris, where, till his death, he held the office of a preacher of the gospel. In 1848, he was elected a delegate to the national assembly by the department of the Seine, but he did not appear to much advantage either in this assembly or in the legislative assembly, of which he was also a member. He wrote many works on religious subjects, history, and literature, all of which are marked by an earnest and liberal spirit. By the more rigidly orthodox of his co-religionists, C. was regarded as a heretic. He died 20th Jan., 1868.

COQUIL'LA NUT, the fruit of a palm, *attalea funifera*. See ATTALEA. It now forms an article of export from South America, being used to a considerable extent in America in the manufacture of buttons and in turnery, as for making knobs of walking-sticks.

COQUIM'BO, the name of a river, province, and city of Chili.—1. The river flows in a westerly direction past the town of C. and empties into the Pacific. Its length is 93 miles.—2. The province of C. extends from the Pacific Ocean to Argentine Republic and is bounded n. and s. by the departments of Atacama and Aconcagua, respectively. It has an area of 12,905 sq. m. and a pop., est. '94, of 199,677.—3. C. the seaport of La Serena, the capital of the province of C., has railway communication with the interior of the mining district and carries on a considerable trade in copper. Pop. with Serena, est. '90, 17,000.

COR'ACLE. See CURRACH.

CO'RACOID BONES. In the mammalian skeleton, the scapula or blade-bone presents a projecting bony process termed the coracoid process, from its supposed resemblance to a crow's beak (Lat. *kŏrax*, a crow); and from the idea that the bones which we are now describing, and which exist in all birds, in saurian and chelonian reptiles and in the monotremata, correspond anatomically with the comparatively slightly developed coracoid process, they have received the name which is now universally assigned to them.

CORAÏS, ADAMANTIOS. See CORAY, ADAMANTIUS.

CORAL, a calcareous secretion or deposit of many kinds of zoophytes (q.v.) of the class *anthozoa*, which assumes very various, and often beautiful forms, according to the different laws which govern the gemmation of the polyps of the different species. The C. producing zoophytes are compound animals, which increase by gemmation, young polyp buds springing from the original polyp, sometimes indifferently from any part of its surface, sometimes only from its upper circumference, or from its base, and not separating from it, but remaining in the same spot, even when the original or parent polyp has ceased to exist, and producing buds in their turn. The calcareous deposition begins when the zoophyte is still a simple polyp—owing its existence to oviparous reproduction—adhering to a rock or other substance, to which the calcareous matter becomes affixed, and on which the C. grows or is built up, the hard deposits of former generations forming the base to which those of their progeny are attached. One layer of the calcareous polyp cells of which the greater number of corals are composed, occasionally surrounds another like the concentric circles in the wood of exogenous trees; one layer is sometimes deposited above another; the whole structure sometimes branches like a shrub, spreads like a fan, or assumes the form of a cup, a flower, or a mushroom. Under the common name C. are included many species, also designated madrepores (q.v.), and some have received other names derived from peculiarities of their form and appearance, as brainstone C. (q.v.), etc. In the greater number of kinds, besides the calcareous plates which form and separate the polyp cells, and which are variously arranged according to the form and structure of the polyps themselves, there is a more solid internal or central calcareous part, formed by the additional deposition of calcareous matter at the bottom of each polyp cell, or from the common living part in which the polyps are united. The calcareous framework is further strengthened by a greater or less mixture of horny animal matter with the pure calcareous substance. This calcareous framework is analogous to the cartilaginous, leathery, or fibrous framework of many other compound zoophytes, as *alcyonium* (q.v.), or *dead man's fingers*. The polyps of the common RED C. (*corallium rubrum*) indeed very much resemble those of *alcyonium;* but the central axis in this and other corals forming the family *corallidæ* is quite solid, being produced in concentric layers by the living gelatinous substance, which envelops it like the bark of a tree, and from which the polyps project like buds, or, when their tentacula are expanded, like little flowers. In the *madreporidæ*, the general structure more nearly resembles that of *alcyonium*. Many of them, however, have the whole calcareous framework covered as in the *corallidæ*, by a gelatinous living substance which unites all the polyps. The whole living part soon decomposes and disappears, when the C. is taken out of the water; in some species, almost immediately running from the calcareous part as a watery slime.

The C. of commerce, or common RED C.—so much admired for its fine color, susceptible of a high polish, and much used for ornamental purposes—is chiefly obtained from the Mediterranean, in some parts of which extensive "coral fisheries" are carried on. It

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is brought up from considerable depths by means of a sort of grappling apparatus dragged after a boat or boats; the pieces being broken from the bottom by beams of wood which are sunk by weights, and then entangled among hemp. Red C. has a shrub-like branching form, and grows to the height of about one foot, with a thickness like that of the little finger. Much of the C. of the Mediterranean is exported to India, but red C. is also obtained in the Red sea, the Persian gulf, etc.—BLACK C. (*antipathes*), the axis of which is rendered still more solid by the greater mixture of horny with calcareous matter, is still more highly prized. C. was known to the ancients, and was used for ornamental purposes by the Gauls.

CORAL FLOWER, or CORAL TREE, *Erythrina*, a genus of trees and shrubs, of the natural order *leguminosæ*, suborder *papilionaceæ;* of which the species, natives of tropical and subtropical regions, generally produce long spikes of beautiful flowers of a rich dull crimson or a scarlet color, resembling coral. The leaves have three leaflets. The *standard* of the flower is remarkably long.

CORAL ISLANDS exist most abundantly in the tropical and sub-tropical parts of the Pacific ocean. The formation of coral goes on, in favorable circumstances, with wonderful rapidity, for masses of coral have been found to increase in height several feet in a few months; and a channel cut in the reef surrounding a coral island, to permit the passage of a schooner, has been choked up with coral in ten years. It was at one time supposed that the coral polyps began their labors at the bottom of the ocean, and reared their pile from its greatest depths; but it has been ascertained that none of them live at depths of more than 20 or 30 fathoms, and most of them are inhabitants of much shallower water. It appears, therefore, that the foundation of their still marvelous structures must be on rocks that do not reach the surface, probably in most cases volcanic rocks similar to those which, being further upheaved, form the volcanic and often mountainous islands of Polynesia. Around these volcanic islands, which—although some of them are the largest islands of the Pacific ocean—are far fewer in number than its C. I., a fringing reef of coral is often found immediately attached to the land; whilst in many other cases, the reef surrounds the island, the intervening space—of irregular, but nowhere of great width—forming a lagoon or channel of still water, protected by the reef from winds and waves. According to a theory proposed by Mr. Darwin, (disputed by Semper and Murray,) this later kind of reef is formed from a reef of the former or merely fringing kind, by the gradual subsidence of the rocky basis carrying down the fringe of coral to a greater depth; whilst the greatest activity of life is displayed by polyps of the kinds most productive of large masses of coral in the outer parts which are most exposed to the waves. In this manner also he accounts for the formation of true C. I., or *atolls*, which consist merely of a narrow reef of coral surrounding a central lagoon; and very often of a narrow reef—perhaps half a mile in breadth—clothed with luxuriant vegetation, bordered by a narrow beach of snowy whiteness, and forming an arc, the convexity of which is towards the prevailing wind, whilst a straight line of reef not generally rising above the reach of the tide, forms the chord of the arc. There is generally a navigable passage through the reef into the inclosed lagoon, the waters of which are still and beautifully transparent, and the depth of water close to the precipitous sides of the reef is almost always very great. The passages through the reefs surrounding the larger volcanic islands are often opposite to the months of streams; but even where this is not the case, there is a strong current in these channels from the flux and reflux of the tides. Islets bearing a few cocoa-nut trees often appear at intervals in the line of a low coral reef, and very generally mark the sides of passages through it. When a reef has reached the surface of the water, sand, shells, fragments of coral, and other substances, begin to accumulate, and cocoa-nut trees often grow where the waves still wash their roots. Further accumulations from the ocean, with decayed leaves, stems, etc., gradually convert the reef into fertile land. Many C. I., of considerable extent and population, are nowhere more than a few feet above the level of the sea. Sometimes a volcanic upheaval seems to have taken place after the coral was formed, and this is supposed to have been the origin of the islands—comparatively few in number—called *crystal islands*, composed of coral rock, more or less modified by the action of air, water, and other agents. Islands of this class sometimes rise to an elevation of 500 ft., and often exhibit precipitous cliffs, and contain extensive caverns. They do not exhibit, however, the picturesque beauty of the volcanic islands, nor the soft and gentle loveliness which often characterizes the true C. I., and which has received the enthusiastic praise of all voyagers in the south seas.

Coral reefs sometimes include within their circuit more islands than one. Reefs also sometimes extend to a great length in a straight line, generally parallel to a coast, the submergence of which they are supposed to indicate. There is such a reef on the e. coast of Australia, extending not less than 350 m. See POLYNESIA.

COR'ALLINE, *Corallina* and *Corallinaceæ*, a genus and family of marine *algæ*, of the sub-order *ceramiaceæ*, remarkable for rigidity, which is mostly owing to a calcareous incrustation. When the calcareous matter is removed by a weak acid, the resemblance to other *ceramiaceæ* becomes very apparent. The common C. (*C. officinalis*), extremely abundant on the British coasts, at first appears as a thin, round, shelly, purplish patch, on a smooth rock, the shell of a mollusk, or the frond of a sea-weed, gradually enlarges.

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and usually sends up a frond of jointed branching filaments, in a bushy tuft, an object of great beauty in the rock-pools. Although, as its name imports, this C. was once *officinal*, it has no medicinal virtues. Some of the corallines expand into leafy lobes, usually fan-shaped. Corallines are most abundant in tropical seas, and there display their greatest beauty.

The name C. is often popularly given to zoophytes of the class *anthozoa*, and genera *sertularia, thuiarea, antennularia, plumularia, laomedea, campanularia*, etc., having branching polypidoms and hydraform polyps of which the British coasts produce many small but extremely beautiful species.

CORAL RAG, a group of the Oxford or middle oolite (q.v.), consisting of continuous beds of petrified corals of very variable thickness, interstratified with beds of oolitic limestone. These strata occur in the northern districts of Berkshire, England, and again, with the same characteristics, in Yorkshire, while in the intermediate district the whole group seems to disappear. It attains to a maximum thickness of 190 feet. The corals retain the position in which they grew at the bottom of the sea; they sometimes form masses 15 ft. thick. The characteristic genera are *isastræa, thamnastræa*, and *thecosmilia*. With them are associated the remains of mollusca and echinodermata.

CORAL SEA, so called from the substance of its numerous reefs, is that section of the Pacific which stretches between Australia on the w. and the New Hebrides on the east.

CORAL WEDDING. See WEDDING ANNIVERSARIES.

CORAM, THOMAS, 1668–1751; an English philanthropist who began life as a seaman and rose to be a merchant captain. He settled in Taunton, Mass., where he was for several years engaged in farming and boating. In 1703, he returned to England, where, after long exertion and waiting, he established a hospital for foundlings, opened in Holton Garden, Oct. 17, 1740, with 20 inmates. Coram was also one of the promoters of English settlement in Georgia and Nova Scotia; but the hospital and other charities took the most of his attention, and on them he spent all his estate, so that in his old age an annuity was settled upon him by private subscription.

COR'ANACH, CORANICH, CRONACH, etc., a funeral dirge, formerly in use among the Irish and Scottish Celts. The word is probably derived from the Gaelic *cornh-rdnaich*, a crying together. "The cries (coranich) are called by the Irish the ulagohne and hululu, two words extremely expressive of the sound uttered on these occasions (funerals); and being of Celtic stock, etymologists would swear to be the origin of the *ololugon* of the Greeks, and *ululatus* of the Latins."—Pennant's *Tour*.

The C. seems to be identical with the Irish *caóine*, generally written and pronounced *keen*, a dirge for the dead, "according to certain loud and mournful notes and verses," wherein the pedigree, property, the good and great deeds of the deceased, and the manner of his death are recounted, in order to excite sorrow or revenge in the hearers, and to show them the loss they have sustained.

The word, in one or other of its forms, occurs in the writings of many of the ancient Scottish authors:

> "Cryand for you the cairfull corrinoch"
> *Sir D. Lindsay.*
>
> "Cyrand the corynoch on hie."
> *Battle of Harlaw.*
>
> "Be he the correnoch had done shout."
> *Dunbar.*

The C. has long since fallen into disuse among the Highlanders. The funeral lament performed on the bagpipes, which may be considered as an instrumental C., lingered on till the latter half of the 18th century.

For specimens of the C., see sir Walter Scott's *Lady of the Lake*, and accompanying notes; Crofton Croker's *Researches in the South of Ireland;* and *Blackwood's Magazine*, vols. xiii. and xxiii.

COR ANGLOIS, a wind-instrument of the reed species, the body of which is bent in the form of part of a circle. It is just a large oboe, and played on by oboe-players. Its compass is from F, fourth line in the bass, to B flat above the treble staff. Music for this instrument is written a fifth above the real tones.

CORA'TO, a large t. in Southern Italy, province of Bari, 25 m. w. of Bari, is situated on a fertile plain, where much cattle is reared. Pop. '81, 30,428. It is an ugly, dirty town, although it boasts of having been founded by the Normans. It has a fine church, fine convents, and an orphan asylum. It was between C. and Andria that the famous "challenge or tournament of Barletta" took place between 13 Italians and 13 Frenchmen on Feb. 13, 1503, in which the Italians were victors.

CORAY', ADAMANTIUS 1748–1833; a Greek scholar, the son of a merchant of Smyrna. He studied medicine in France, and being poor was obliged to support himself by translating English and German works into French. In Paris, in 1788, he published a number of political tracts looking towards the liberation of his countrymen from Turkish control. Napoleon employed him to translate Strabo, and gave him a

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pension. He wished to revive in Greece the study of the ancient writers, and edited many classic texts with notes. The most celebrated of his works are the editions of the *Ethics* and *Politics* of Aristotle. His whole life was spent in the effort to promote the culture of his countrymen, and the literary language of modern Greece owes much to him. See Fyffe's *Modern Europe*.

CORBAN, a gift or oblation to God, on pretense of which a person might reserve from sons or parents the use of property. Property so dedicated went into the keeping of the Pharisees of the Jewish temple. They held that no matter how rashly such a dedication was made, the act released the person from any duty to aid another with what he had so devoted.

CORBAUX', FANNY, b. 1812; an English painter and scholar. The failure of her father reduced her to poverty when but a child. She determined to make her way as a painter, and although her own instructor, she soon achieved a good position, excelling in portrait-painting particularly. She also became an excellent Biblical scholar, and wrote a series of letters on the *Physical Geography of the Exodus*. She d. 1883.

CORBEIL, a t. in France at the head of an arrondissement in the department of Seine-et-Oise, at the junction of the Essonne with the Seine, 18 m. s.s.e. of Paris; pop. '91, 8184. From the 10th to the 12th c. it was the chief town of a powerful countship. It was besieged by the duke of Burgundy in 1418, by the Huguenots in 1562, and by Alexander Farnese in 1590. The church of St. Spire was rebuilt in the 15th c.; St. Jean-en-l'Isle belonged to the templars, and dates from the 13th century. In the modern town there are flour mills, and printworks, cotton factories, manufactures of watches, clocks, etc.

COR'BEL (Fr. *corbeille*, a basket). In architecture, this term, adhering originally to its etymological meaning, signified an ornament in the form of a basket, like those sometimes set on the heads of caryatides. In Gothic architecture, to which it is now almost peculiar, it is applied to any kind of ornamented projection used for supporting pillars or other superincumbent weights. Here also its form probably was at first that of a basket projecting from the wall, in which the end of the pillar was placed, and on which it rested. Latterly, the more ordinary form was that of a head, with the face looking outwards or downwards. In this form it is found in all the styles. A recumbent animal, again, is sometimes placed under the pillar, and there are a great variety of other forms. When any construction is carried out, so as to rest on corbels, and to project beyond the face of a wall, it is said to be *corbelled out*. See BRACKET, CANTALEVER, CONSOLE.

COR'BIE, a heraldic term for a raven. See CORBIE-STEPS.

COR'BIE-STEPS, or CROW-STEPS (Fr. *corbeau*, Lat. *corvus*, a crow). The word corbie or corby, though obsolete in English, except as a heraldic term, has retained its place in the Scottish dialect, and in architecture corbie-steps signify the succession of steps with which the gables of old houses are everywhere ornamented in Scotland. The fashion, like most of the other peculiarities of Scottish architecture, was no doubt borrowed, as was the term, from France. In the domestic buildings of Edinburgh, it is found in the highest degree of prevalence between 1620 and 1640. The notion, of course, was that the steps were for the use of the crows. This gable ornament is by no means peculiar to France, but is met with in Flanders, Holland, and all over Germany.

COR'BOULD, EDWARD HENRY, b. 1815; son of Henry, and also an artist. At an early age he painted "The Fall of Phæton from the Chariot of the Sun," for which he received a gold medal from the society of arts. Since that period he has produced a great number of large pictures. In 1851, he was appointed instructor of historical painting to the royal family. He excels in pageants and chivalric subjects.

COR CAR'OLI. See CONSTELLATION.

COR'CHORUS, a genus of plants of the natural order *tiliaceæ*, having five sepals, five petals, numerous stamens, and a capsule; and containing a number of species, both shrubby and herbaceous, natives of the warm parts of the globe. *C. olitorius* is widely diffused in tropical countries, and is supposed to be a native of Asia, Africa, and America. It is an annual, with a smooth, more or less branching stem; varying in height from 2 to 14 ft. or upwards, according to soil and climate. It has smooth, stalked, alternate, oval, or ovato-lanceolate leaves, and small yellow flowers, solitary or in pairs on foot-stalks. It is much used as a pot-herb, and is called JEWS' MALLOW, from being much cultivated by Jews in Syria and other parts of the east. It is still more valuable for the fiber of its inner bark, as is also *C. capsularis*, a species very similar, but distinguished by the want of transverse partitions in its capsule. Both are much cultivated in India, yielding the greater part of the JUTE (q. v.) of commerce, and of the fiber employed in making *gunny bags* (q. v.). *C. capsularis*, being extensively cultivated in China, is sometimes called CHINESE HEMP.

CORCORAN, WILLIAM WILSON, born Georgetown, D. C., 1798; was bred a merchant, but failed in business and became an exchange broker in Washington; in 1840 formed a partnership with George W. Riggs. He was appointed financier of the government during the Mexican war and thus laid the foundation of an immense fortune, which he used with liberality and munificence. He was noted as the founder of the "Louise Home," the Georgetown cemetery, and the Corcoran art gallery, and by his many liberal endowments to colleges and benevolent associations. D 1888.

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CORCY'RA. See CORFU.

CORDAGE, a seaman's name for the running rigging of a ship, as distinguished from the standing rigging. The name is also given to the store of rope kept in reserve. See RIGGING, ROPE.

CORDAY D'ARMANS, MARIE ANNE CHARLOTTE, known as CHARLOTTE CORDAY, was b. at St. Saturnin in the department of Orne, in 1768. Though descended from a noble family, she early imbibed revolutionary principles, but was horrified at the monstrosities of the Jacobins; and her hatred of their acts was intensified by converse with a party of proscribed Girondists, who had fled to Normandy. She resolved to rid her country of one of the principals of the Jacobin faction, and with that view traveled to Paris. Whether to slay Robespierre or Marat, was an open question with her; but while she was debating the matter with herself, a demand of the latter for a hundred or two hundred thousand more victims for the guillotine, marked him out for her weapon. Twice she sought admission to Marat unsuccessfully, but on a third occasion (July 13, 1793), was admitted on the plea that she had important news from Caen to communicate. She found Marat in his bath, who, to some statement she made, declared that the Girondists who had fled to Normandy, some of whom were her own friends, would be guillotined in a few days. She no longer hesitated, but plunged her dagger into the monster's heart, who expired with a single groan. She was at once arrested and brought before the revolutionary tribunal, where she boldly avowed and justified her act. She was of course condemned to the guillotine, and the sentence was carried into effect on the 17th July, 1793. Her beauty added greatly to the interest which her sanguinary heroism inspired.

CORDELIERS ("cord-wearers") was the name applied, in France, to the strictest branch of the Franciscan friars, on account of their wearing a girdle of knotted cord. At one period, this order had no less than 284 male and 128 female convents. During the revolution, the name was applied to the members of a political club which assembled in the chapel of a Franciscan monastery, and exercised (chiefly in Paris, however) great influence on the progress of the revolution. It was instituted in 1790. Its leaders were men of various opinions, including Danton, Hébert, Camille Desmoulins, and Marat. The C. were generally opposed to the Jacobins (q.v.); but it may be asserted that in these two clubs all the great popular movements of the revolution had their origin. In the session of the C., May 22, 1793, the insurrection which marked the close of the reign of terror was plotted. While the club was at the height of its influence, Camille Desmoulins commenced to issue his popular journal, *Le Vieux Cordelier*. Soon after the fall of Danton, the C. club lost its influence, and was an insignificant affair when it was closed by the convention.

CORDER, FREDERICK, musician, b. in London, Jan. 26, 1852. He studied at the Royal Academy of Music, London, and gained the Mendelssohn scholarship in 1875. After studying in Cologne under Ferdinand Hiller, he returned to London, and in 1880 became conductor of the orchestra at the Brighton aquarium. His works include *Morte d'Arthur*, opera, 1877–79; *In the Black Forest*, suite for orchestra, 1879; *The Bridal of Treirmain*, cantata, 1886; *Roumanian suite for orchestra*, 1887; *The Minstrel's Curse*, ballad, 1888, and *The Sword of Argantyr*, cantata, 1889. With his brother Henry, he has translated the libretti of Wagner's music dramas into English.

COR'DERIUS, OR **CORDIER,** MATHURIN, 1478–1564; a native of Normandy; author of the *Colloquia*. He was especially fond of teaching children, and taught at Paris, where John Calvin was one of his scholars. He subsequently taught at Geneva. He wrote a number of books for children, one of them (the *Colloquia*) passing through almost innumerable editions, being used in schools for three centuries after his time.

CORD-GRASS, *Spartina*, a genus of grasses having compound spikes, the spikelets, arranged on one side; and having only one perfect floret, and very unequal glumes. One species, *S. stricta*, found in muddy salt-marshes on the e. and s.e. coasts of England, although remarkable for its extreme stiffness and rigidity of habit, is used for making ropes, on account of the toughness of its fiber.

CORDIA'CEÆ, a natural order of exogenous plants, closely allied to *boragineæ*, from which it differs chiefly in its drupaceous 4 to 8-celled fruit. It consists of trees with rough leaves, chiefly natives of the tropics, although some are found in cool parts of South America. The fruits called sebesten (q.v.), or sebesten plum, belong to this order, and to the genus *cordia;* which also contains some valuable timber-trees, particularly the Spanish elm, prince wood, or *bois de chypre* of the West Indies (*C. gerasacanthus*). It is a dark-brown wood, faintly striped, tough, elastic, and fine grained.

CORDIERITE, DICHROITE, or IOLITE, a natural silicate of magnesia, alumina, and ferric oxide. It crystallizes in stout orthorhombic prisms, and is of various shades of blue, sometimes with a tinge of gray or brown.

CORDILLE'RAS OF CENTRAL AMERICA. This section of the great mountain chain which stretches almost without a break, from the Arctic ocean to the extreme s. point of South America, is confined to the isthmus of Panama and the small states of Central America. In Mexico, the United States, and British America, the main chain is called the Rocky mountains, and the long unbroken line skirting the Pacific coast of South America is known as the Andes. The Cordilleras present their lowest

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elevation in the Panama isthmus, where the summit level (of the Panama railroad) is less than 300 ft.; and there, too, the breadth of the range is least, varying from about 30 to 70 miles. At another point, there is said to be a pass which is only 150 ft. above tide. In recent years all this region has been explored with a view to the construction of a ship canal from the Atlantic to the Pacific, and recently (Dec., 1889) work was begun upon the route from Greytown to Brito via lake Nicaragua and the San Juan river. The great obstacles to isthmus exploration are the extreme unhealthfulness of the climate, the continuous fall of rain, and the impenetrability of the tropical vegetation. Towards the Pacific, the slope of the mountains is abrupt and steep; towards the Atlantic it is more gradual. On what is known as the Nicaragua route, in the state of that name, the San Juan river finds its way through the e. branch of the mountains to Nicaragua lake, and that lake reaches within 12 m. of the Pacific; and on that narrow strip there runs a belt of the Cordilleras not too formidable for canal engineering. Extinct and active volcanoes are common in these mountains, more especially in the e. range. Between these e. and w. ranges is a central basin about 300 by 150 m., comprising nearly the whole of the state of Nicaragua, and embracing much grand and beautiful scenery. From the waters, and near the shores of lake Nicaragua, rise enormous volcanoes, their sides rent with fissures and black with lava. Smoke and flame come from some of these volcanoes, but lava is seldom seen. The Cordilleras exhibit about the same scenery in the states of Honduras, San Salvador, and Guatemala. There are five volcanoes in San Salvador, and six in Guatemala; one of the latter, 14,000 ft. high, throws up water only. Silver and copper ores are found, and there is great abundance of red cedar, rosewood, mahogany, india rubber, boxwood, vanilla, cochineal, etc. The temperature in the interior is seldom excessive. Going towards Mexico, the height of the ranges decreases, and at the isthmus of Tehuantepec the highest pass between the oceans is in one place only 700 feet. Further north, the mountains spread out and form the great tableland of Mexico, with here and there isolated summits, some of which are actively volcanic, and many of which rise to very great heights.

CORDITE. See EXPLOSIVES.

COR'DON, in military operations, is a line of sentries inclosing or guarding any particular space of ground, to prevent the passage of persons other than those belonging to the army. The sentries are placed within sight of each other. If intended to guard against contagious diseases, it is called a *C. sanitaire.*

CORDON BLEU; knights of the ancient order (in France) of the Saint Esprit, or Holy Ghost, were so called because the jewel of the order was suspended on a blue ribbon. In late times, the term was degraded to mean a first-rate cook. The "cordon grand" is any member of the legion of honor, their decorations being suspended by a broad (or grand) ribbon.

COR'DOVA, a province in s. Spain on both sides of the Guadalquivir, intersected by railroads that connect with the ports of Cadiz and Malaga, and the railroad system northward; 5,190 sq. m.; pop. '87, 420,728. N. of the Guadalquivir the country is mountainous; to the s. are the plains called La Campina. The land is fairly productive, and oil, wheat, wine, etc., are the products. Live stock are raised, and there are mines of silver, copper, iron, lead, and coal. The chief town is the ancient city of Cordova.

CORDOVA, the capital of a state of the same name in the Argentine Republic (q. v.), is situated on the Rio Primero, a tributary of the Parana, in lat. 31° 26′ s., and long. 63° 55′ west. It was founded by the conquerors of Tucuman in 1573. It has a cathedral and several churches, with a pop. in 1895 of 42,700. The state of which C. is capital is situated near the center of the confederation, and contains about 54,000 sq. m., with a pop. in 1895 of 351,745, who occupy chiefly its western section. Cattle, sheep, and goats are raised, and agriculture is followed, but the water supply is defective.

COR'DOVA, or **COR'DOBA,** a city of Spain, capital of the province of Cordova, is situated in the midst of olives and palm-trees on the Guadalquivir, here crossed by a stone bridge of 16 arches, constructed by the Moors. Lat. 37° 52′ n., long. 4° 49′ west. Its old Moorish walls and convent-crowned hill in the background give it quite an oriental aspect; but its beauty, like most oriental beauty, is merely external; inside, its streets are narrow, dark, and dirty, with a general appearance of decay. Many gardens are inclosed within the walls. Among the principal buildings is the cathedral, formerly a Mohammedan mosque, an immense structure dating from the 8th c., and generally regarded as the finest type of a Moslem temple in Europe. Inside are numerous columns, composed of various-colored marble, jasper, and porphyry. The bishop's palace, an old residence of the Moorish kings now used as stables, and several of the churches and convents, are also noteworthy. C. was at one time celebrated for its manufacture of Cordovan (q. v.), but that has now greatly declined. Its silversmiths and filigree workers have still a good reputation; and there are manufactures of paper, silken fabrics, hats, etc. Its inhabitants are proud, above even the pride of Spaniards. Pop. '87, 55,614. C. is a very ancient place, having been founded by the Romans as Corduba, 152 B. C. Cæsar, 45 B. C., put 22,000 of its inhabitants to death for having

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sided with Pompey. Taken by the Goths in the 6th c., it soon after fell into the hands of the Moors, and became the capital of the Moorish empire in Spain. From the 9th c. to the 12th c., it was one of the greatest centers of commerce in the world, and is said to have contained a million inhabitants. It was taken by Ferdinand III. of Castile in 1236, and never afterwards regained its prosperity. In modern times, C. was taken and plundered by the French under Dupont in 1808. C. is the birthplace of the two Senecas, the poet Lucan, and the astronomer Averroes. The province of Cordova has an area of 5,190 sq.m., and a pop. (1887) of 420,728. See ANDALUSIA.

COR'DOVA, FERNANDO FERNANDEZ DE, b. 1792; a Spanish commander who began military service in 1810, serving in the wars against Napoleon. In 1841, he was implicated with Concha in the conspiracy against Espartero; in 1847, he was minister of war, and afterwards inspector-gen. of infantry. In 1850, he was capt.gen. of Cuba. In 1853, he was made gen.-in-chief of cavalry. He attempted to support Isabella in the outbreak of 1854, but when the revolution became successful he fled to France. He returned a few years later, and in 1864, Narvaez made him minister of war. In 1868, in common with most of the Spanish grandees, he took part in the Prim revolution against Isabella. In 1870, he was again appointed capt.gen. of Cuba, and in 1871 he was made minister of state *ad interim* at Madrid. He d. in 1883.

CORDUROY, a ribbed kind of fustian (q.v.), a thick cotton stuff made after the fashion of velvet.

CORDUROY ROAD, a roadway in marshy places formed by laying logs side by side across it, so called from its rough or ribbed surface, resembling corduroy.

COR'DOVAN, a species of leather prepared from goat-skins. It was originally, and at one time exclusively, manufactured by the Moors of Cordova, and hence its name. The best C. still comes from the Levant. It is used in book-binding, and in the finer kinds of boot and shoe making.

CORDYLINE. See TI.

CORE'A, a peninsular kingdom of Asia, formerly tributary to China; lat. 34° to 43° n., and long. 124° 40′ to 130° 30′ e., with an area estimated at 82,000 sq. miles. It is bounded e. by the sea of Japan; s. by the Yellow sea; w. by the Yellow sea and gulf of Pechili; and n. by the rivers Ya-lu and Tu-mên, which separate C. from Chinese and Russian Mantchuria respectively. These rivers take their rise from the eastern and western slopes of the vast desert mountain-tract of Ch'ang Peh Shan. Other considerable rivers are the P'ing Yang, discharging into the Yellow sea in lat. 39°; and the Han, also flowing w., near the mouth of which is the capital, Sëoul or Saul (Chinese, Wang King). All accounts represent the country as mountainous throughout, densely wooded in some districts, with valleys moderately fertile. The climate, which in the n. is glacial, is elsewhere like that of Japan. There is ice and snow everywhere in winter. The rainfall of C. is excessive.

There is good reason to connect the people with the Tungusic stock that has peopled the whole of northern Asia. The features of the Coreans are more pronouncedly Mongolian than those of the Japanese, whom they most resemble. The language, which is intermediate between Chinese and Japanese, resembles the latter in its polysyllabic form and alphabet, and has affinity with the existing Mongolian tongue. The native alphabet and writing is almost disused; the Chinese character is everywhere known. The religion of C., like its other official institutions, is based on that of China; the Chinese state gods are everywhere worshiped; Buddhism and Taoism have their votaries; and the literati profess the Confucian ethics. The monarchy is a despotism limited by the existence of privileged ranks and hereditary nobles. The officials are selected. The life of the Coreans is very primitive; the chief articles of food are inferior kinds of rice and grain. Agriculture is very backward. A little tobacco, cotton, and silk is produced. The principal fabrics are of coarse hemp. The only products bartered with the Chinese are paper and ginseng. Mineral treasures abound; gold, iron, copper, and coal are found; but the mineral resources are not developed. The pop. is variously estimated at from 8,000,000 to 16,000,000.

C. has steadfastly maintained a policy of strict isolation towards all outsiders, even towards the Chinese, with whom there is no intercourse save on occasion of the annual embassy, which is accompanied by a few privileged traders, and of the periodical fairs at the "gate-town," near the city of Fêng-hwang, in Mantchuria. The Chinese dislike to everything foreign is strengthened in the case of C. by traditions of ancient enmity between China and Ch'ao-sien, as C. was called in the 2d century B.C. The Mongol conquerors of China reduced C. also; but the Ming dynasty restored the Corean sovereign with the title of Kaoli-Wang (from which word Kaoli, through the Japanese form Ku-rai, comes the name Corea). Strange to say, the seeds of Christianity were sown in C. in 1592 by the invading army, composed chiefly of Christian converts, of the Japanese usurper, Taicosama. Hamel, a Dutch sailor, was wrecked here, and detained for 13 years; from his narrative it was that, till very recently, most of our scanty knowledge of C. was obtained. In 1784, Jesuit missionaries found their way into C., and had great success amongst the people. From 1835 till 1866, several intrepid and devoted French missionaries contrived to find shelter; and, in spite of incessant persecutions, the Christian community continued rather to increase, rising again, in 1852, to 11,000 souls. The

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massacre of nine missionaries, in 1866, led to an invasion of C. by a small French force, but without success. Nor did two successive American expeditions, provoked by an attack on an American vessel, succeed in contributing at all to break down the barriers that have so long separated the Coreans from the rest of the world. The name Corea comes from that of the ancient province Koria or Kokorai. The French call it Corée. It was first colonized by Kishi (Chinese, Ki Tsze), a Chinese courtier and reputed author of part of the Shu-King, the classic edited later by Confucius. Kishi introduced the elements of the civilization of ancient China into the peninsula, which he named Cho-sen. The early history of Corea is known through the Chinese and Japanese annals, the latter being very full, while many works on Corea exist in Japan. The ancient boundaries of Corea far exceeded their present limits. From a little before the Christian era, until the 10th c., the peninsula was divided into the three kingdoms of Shinra (or Shiraki), Korai (or Koma), and Hiaksai (or Kudara); or in Chinese, Sinlo, Kaoli, and Petsi. Though civil war was almost constant between the three states, with occasional wars with or invasions from China, and much help or conquest from Japan, yet in spite of war, the arts flourished, and it was through Corea, and not from China directly, that Japan received those elements of her civilization which are of Chinese origin. Corea sent to Japan many scholars, artists, and men of skill in every trade and profession, and the basis of nearly every order of arts or handicrafts in Japan is Corean. The most noted ancient invasion of the Japanese is that of the empress, Jingu Kogu, in the 3d century. Fusan (q.v.), on the e. coast, has been held by the Japanese from very ancient times. In the 10th c., Shinra obtained supremacy in the penisula, and united Corea was then named Kori (Jap. Korai). In 1231 A.D., the Mongols invaded Corea, and in 1256, reduced it to vassalage, after a bloody resistance, the Corean king going in person to the court of the conqueror of continents to do homage. Anxious to humble Japan, Khublai Khan made Corea his base of operations for his expedition in 1273 which failed, and in 1281 for his mighty armada of 3,500 war junks, and 180,000 Tartars, Coreans, and Chinese. Of his vast fleet and host, few escaped the storm and the arrows of the Japanese. The Korai dynasty came to an end in the 14th c., the Corean king refusing or neglecting to pay tribute to the Ming emperors of China. A Chinese army was sent against Corea, and Li-tan or Tai-tso dethroned the king, and, being made sovereign by the army, made offers of homage to the Chinese emperor, and received investiture as Cho-sen-o (king of Cho-sen), the ancient name of the country having been restored. This was in 1392. The dynasty thus established, rules Corea to-day. In 1597, Hideyoshi (Taiko Sama) having unified all Japan, resolved on the invasion of China through Corea, and sent word to the latter to resume in full form her ancient relation as tributary vassal. Corea having insultingly refused, Hideyoshi dispatched an army of 160,000 Japanese veterans, under command of his generals Konishi and Kato, to invade Corea. So well organized and equipped was the advance detachment, that within three weeks after their landing at Fusan, they had reduced the castles along the line of march and were in the Seoul, or capital (see SEOUL). Pushing northward to Ping Yang, this city was occupied, and the army of Konishi was reinforced by the other corps which had overrun the seven other provinces of the peninsula. A Chinese army of 40,000 men now entered Corea, the first battle between the allies and invaders being fought at Ping Yang (q.v.). Falling back on Seoul, the Japanese fortified it, but massing their forces, left their intrenchments and gave battle to the allies. In the hard-fought battle which ensued, ten thousand men were said to have fallen. Diplomacy at Pekin and Kioto, and in Corea, checked hostilities for a time; but the war was renewed with fresh vigor. Several severe naval battles on a large scale were fought; on land the castle of Nangan, one of the strongest fortresses in the kingdom, was taken by the Japanese, the Chinese commander slain, and 3,726 heads of Chinamen and Coreans were cut off and made into a trophy. The final pivot of the war was at Urusan castle, a few miles n. of Fusan. During the siege, which lasted one year, the large Japanese garrison was reduced by the straits of hunger to eat human flesh. Being relieved, a great pitched battle fought near the castle resulted in bloody defeat of the Chinese and Coreans. The death of Hideyoshi occurring soon after, the Japanese armies were withdrawn, and peace was made on the basis of Corea's tributary vassalage to Japan. In 1636, the Manchu Tartars invaded Corea, the king receiving investiture from the Manchu, who soon afterwards entered China, and established the present dynasty on the throne of China. From early times Corea acknowledged the suzerainty of China and paid tribute to the Chinese emperor; a suzerainty which was disputed by Japan. The geographical position of C. unfortunately rendered her vulnerable to every invasion from e. or w., and made her like grist between two great rival nations as millstones. No seeds of Christianity were left by the Japanese army, though Konishi's division was largely composed of converts of the Jesuit missionaries in Japan; nor by the crew of the Dutch ship *Sparwehr*, shipwrecked off Quelpaert island in 1653, and detained as prisoners in Corea until 1667, when they escaped, Hamel, the supercargo, writing an account of their adventures. Christianity began in 1777. Piek-i, a young Corean scholar in a coterie of learned men, having found some books on Christian doctrines, composed in Chinese by the Jesuits at Pekin, brought into Corea by a member of the embassy, began the practice of the Christian life, and the propagation of the new ideas. The native Christians increasing, ignorantly formed a hierarchy among themselves, but abandoned it as greater knowledge showed

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them their error. European attempts to convert the natives to Christianity in subsequent years met with slight success. Several missionaries having been put to death, in 1866, the French admiral, Roze, with seven ships and 1000 men, captured Kanghoa city (q.v.), but suffered repulse while attacking a fortified monastery, and the badly-planned expedition failed. In Aug., 1866 the American schooner, *General Sherman*, with a cargo of cotton goods, glass, tin plate, etc., and heavily armed, left Chifu, China, on a trading or semi-piratical expedition to Corea. She had on board 19 Malay and Chinese sailors, and five foreigners, viz.; Mr. Wm. B. Preston, owner, and the captain and mate, Americans; Mr. Hogarth, supercargo, and the Rev. Mr. Thomas, Englishman. The latter, though warned of the character of the cruise, went on board as interpreter, and to improve his knowledge of the Corean language. Arriving in Ping Yang river, they made their way up to the city. What further befell them is not fully known, but the Coreans most probably mistaking the foreigners for their late enemies, Frenchmen, and being provoked into a quarrel, attacked and killed them all. To obtain redress, the U. S. S. *Wachuset*, Com. R. W. Shufeldt, and the U. S. ship *Shenandoah*, Com. J. C. Febiger, were dispatched in 1867 to the w. coast of Corea, but no satisfaction being obtained, the United States government determined on sending an expedition to the Corean capital. The American fleet under Commodore John Rodgers sailed from Nagasaki, Japan, May 16, 1870, reaching the French anchorage off Kang Hoa on the 23d. The fleet consisted of the *Colorado*, *Alaska*, *Benecia*, *Monocacy*, and *Palos*, the force numbering about 1000 men, and having on board F. F. Low, U. S. minister to China, who was, if possible, to make a treaty with Corea. Negotiations were soon opened; but with unseemly haste, and without right or warrant, four armed steam-launches acting as "surveying boats" were sent up the Hang river, together with the *Monocacy* and *Palos*. The Coreans, resenting this armed invasion of their territory, fired on the Americans, who returned the fire with their heavy guns. June 10, a further expedition of 2 gunboats, the 4 steam-launches, and 759 men, were sent up the river to capture all the forts. Within 48 hours, the landing force and the gunboats co-operating, five forts were captured and dismantled, 50 flags and 481 pieces of artillery were taken, and probably 400 Coreans slain; the American loss being less than 15 wounded and 3 killed, among the latter the gallant Lieut. McKee. The Corean government refusing to open negotiations, the American commodore discharged his prisoners and returned to Shanghai, China. Though England, Russia, France, Germany, and the United States had failed to open Corea, the Japanese, after far greater preparations and equipments, resolved to succeed or go to war. The immediate cause of their action, was the firing by a Corean fort upon one of their gun-boats, the *Unyo Kan*, Sept. 19, 1875. The Japanese having landed for water, and being in uniform similar to that of American sailors, were probably mistaken by the Coreans for the latter, the place being the scene of the fight with the Americans in 1871. The Mikado sent Arinori Mori (see MORI, A.) to Pekin to obtain from China a declaration of neutrality. Receiving from the Chinese a written disclaimer of all authority over Corea, the Japanese government dispatched a fleet and force to Corea, under Gen. Kuroda, intrusting the diplomatic action to Inouye (q.v.). Imitating, even to minutest details, the policy and example of the American Commodore Perry in dealing with Japan in 1854, Kuroda and Inouye gained a like "brain-victory," and a treaty of amity and commerce was signed Feb. 27, 1876.

An ineffectual attempt was made to negotiate a treaty with Corea in behalf of the U.S. by Com. Shufeldt, 1880. Overtures were renewed, and were partially successful, 1882, which resulted in the opening of a few ports to American commerce. The English, French, and Germans procuring the same privilege, the Coreans rose in rebellion against the influx of foreigners, and put to death their queen, her son, and the ministers of state. The Japanese were driven from the country; and the Chinese reasserted their old claim of suzerainty, and occupied C. with troops. The Japanese finally succeeded, however, in subduing the insurrection, and compelling restitution for their losses. An official deputation of Corean nobles visited America in 1883. The Coreans show some desire for trade with this country, and have appointed a consul in New York. Commercial treaties were afterwards concluded with Italy, Austria and Russia. By these treaties the three ports of Inch'yen (Chemulpo), Fusan, and Wensan (Gensan), besides the capital, Seoul, were opened to foreign trade. The influx of foreigners was objectionable to many of the people, and the government, which was directed in internal affairs by the king and his ministers, did not prevent abuses. In 1894 Japan sent a force of several thousand troops to the country for the ostensible purpose of protecting Japanese residents there. The reform of abuses, it was suggested, should be undertaken jointly by Japan and China. To this China, as having suzerain rights over the country, objected, and the result was the war of 1894–95, which was formally declared by Japan, Aug. 1, 1894, and ended in May, 1895, by a treaty in which China gave up her suzerainty and acknowledged the complete independence of Corea. Affairs continued in an unsettled state for some time afterward, Japan refusing to leave the country until the Corean government should carry out certain proposed reforms. The Japanese evacuation of Corean territory was not complete until October, 1896. In the meanwhile, Russian influence had gained the upper hand in Corea, the king and a large number of Coreans having objected to the reforms introduced by the Japanese. The pro-Japanese minister was overthrown and a new pro-Russian cabinet appointed. A body of Russian troops was landed at Chemulpo, and advanced on the capital for the alleged purpose of protecting the Russian legation there. The triumph

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of Russian interests caused the whole revolution to be attributed to the influence of Russia. See CHINA and JAPAN.

The government of Corea is administered by the king as an independent sovereign. His power is, to a certain extent, limited by a cabinet which frames laws for his ratification. The departments of the government are: the cabinet, presided over by the premier; the foreign office; the home office; and the departments of education, justice, agriculture, trade, and industry. The capital is Seoul, with a population of about 218,000. In 1895 the bulk of the foreign population in the kingdom was composed of Japanese, numbering over 10,000. The Chinese numbered about 2,000.

CORELLI, ARCANGELO, surnamed *Il Divino*, an Italian musical composer, was b. at Fusignano in the Bolognese, in 1653. He published many sonatas for violin and bass. In 1700, appeared his sonatas for violin and bass, or harpsichord. This work is one of C.'s masterpieces, and has placed him in the first rank of instrumental composers. C.'s greatest effort was his *Concerti Grossi*, which appeared only six weeks before his death. The style of C. is one of the very best, and his works continue to the present day models of classical study in instrumental music.

CORELLI, MARIE, pen name of MARION MACKAY, daughter of Charles Mackay, the poet; was b. in Italy and educated in London. Among her writings are *The Romance of Two Worlds; Vendetta; Thelma; Ardath, the Story of a Dead Self; Wormwood, a Drama of Paris; The Soul of Lilith; Barabbas; The Silence of the Maharajah* (1895); *The Sorrows of Satan* (1895); *The Mighty Atom* (1896), etc.

CORENTYN', a river of Guiana in South America, rises in lat. 1° n., having its headwaters 25 m. to the e. of those of the Essequibo. With a generally northerly course, it separates the Dutch and British portions of the country; and at its mouth, in lat. 6° n. and long. 57° w., it forms an estuary of 25 m. in width.

COREOP'SIS, a herbaceous plant of the order compositæ, popularly known as tickseed, the fruit being in the shape of a small bug. It is sometimes raised in gardens for the sake of its flowers, which are yellow with a purple center.

CORFE CASTLE, a village in the middle of Purbeck isle or peninsula, in the s. of Dorsetshire, 24 m. e.s.e. of Dorchester. In the vicinity are stone and marble quarries, and clay-works for the potteries. Pop. of parish about 1806. A castle, giving its name to the village, stands on a neighboring hill. It seems to have been founded in the 10th c., and was long one of the strongest fortresses in the kingdom. Here king Edward the martyr was murdered by his step-mother, Elfrida, about 980, and king John, during his disputes with his barons, kept his regalia here for safety. Here also, in 1642, lady Bankes defended the castle for six weeks against Charles I. It was dismantled by Fairfax in 1645.

COR'FU, the most northerly of the Ionian islands (q.v.), in lat. 38° 40′ to 39° 40′ n., long. 19° 10′ to 20° east. It has a length of about 38 m., with a breadth varying from 8 or 4 to 20 miles. Area, 275 sq. miles. Pop. '89, 84,472. Like the rest of the Ionian islands, it is mountainous, and the mountains are generally naked and dry, the highest summit, Pandokrátora, being between 3,000 and 4,000 ft. above the sea. The valleys, however, are very fertile, and yield olive-oil, wine, honey, oranges, figs, etc. Salt is also produced in some quantity. The climate is generally mild and healthy. The principal town, Corfu, underwent great improvements during the British protectorate, and is copiously supplied with water. It is situated on an elevation, has some good streets and a fine esplanade. The town, with 19,025 inhabitants (1889) and a considerable trade, is the seat of an archbishop of the Greek church, and of a Latin bishop. The principal institutions are the penitentiary, the lunatic asylum, the infirmary, foundling hospital, etc. The university, founded by lord Guildford in 1823, now represented by a lyceum, was suppressed when (in 1864) the Ionian islands were incorporated with the kingdom of Greece. At the incorporation it was stipulated that Corfu and Paxo were to enjoy perpetual neutrality. The language spoken is considered the softest of the modern Greek dialects.—The ancient name of the island of C. was *Corcȳra*. It is said to have been occupied first by the Phæacians, and then by the Liburnians; but the accounts of it are somewhat mythical until its settlement by the Corinthians about 734 B.C., and through its commerce it soon after acquired a considerable importance. It soon quarreled with the mother-country, and after many vicissitudes of fortune, passed under the dominion of the Romans about 229 B.C.

CORIAN'DER, *Coriandrum sativum*, an annual plant of the natural order *umbelliferæ*, with branching stem, 1 to 2 ft. high, the lower leaves bipinnate, the upper leaves more compound, and globose fruit. It is a native of the s. of Europe and of the east, and has long been cultivated for the sake of its fruit; and has thus become naturalized in some parts of England, although its fruit (*C. seed*) is much less used in Britain than in Germany, and some other European countries. The whole plant, when fresh, has a very offensive smell, but the ripe and perfectly dry fruit has an agreeable aromatic smell and a sweetish aromatic taste. It is used in medicine as a carminative, and as a corrective of certain purgatives; also in domestic economy as an aromatic, being very often mixed with bread in the n. of Europe; spirituous liquors are flavored with it; and confectioners cover it with sugar, to make a well-known kind of comfit. In the s. of England, it is common to sow C. and caraway together, the C. yielding a crop in the first year, and

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the caraway in years following. C. delights in a rich soil and is much cultivated and used in India.

CORIGLIA'NO, a t. of Italy, in the province of Cosenza, about 4 m. from the gulf of Taranto, beautifully situated on a hill, round which it is built in the form of an amphitheater, a fine old castle crowning the summit. The base of the eminence is clad with lemon and orange groves, amid which rise some elegant villas; the whole rendering C. one of the most agreeable places in the Calabrias. It has a trade in wine and fruits. Pop. 10,600.

CORIN'GA, a maritime t. in the collectorate of Godavery and province of Madras, stands on the s. side of the estuary of a river of its own name, one of the branches of the Godavery. Its harbor is breasted by a bar, which at spring-tide shows a depth of 12 or 14 feet. Besides having a considerable general trade, it is the best place on the coast for the building and repairing of small vessels. It has been twice destroyed by inundations of the sea. In May, 1787, during the n.e. monsoon, the tide overwhelmed the city and the adjacent country, drowning about 15,000 people; and again in 1832, a similar deluge occurred, leaving behind it, besides the more ordinary traces of its power, several ships lying high and dry in fields in the neighborhood. Pop. 4500.

CORIN'NA, a Greek lyric poetess, famous alike for her beauty and genius, was b. at Tanagra, in Bœotia. The date of her birth is not known, but she flourished about 500 B.C. She lived principally at Thebes, and hence is sometimes called a Theban. Ælian states that on five different occasions she vanquished her contemporary, Pindar, in a poetic contest, but Pausanius alludes to only *one* victory of hers. Her townsmen showed their appreciation of her genius by placing a statue of her in their gymnasium She was surnamed *Muia* ("the Fly"), probably on account of the tenderness and softness of her poems. Of her numerous poems, which were composed in the Æolic dialect, only a few fragments remain, which have been published by Schneidewin, in his *Delectus Poetarum Græcorum* (Gött. 1839), and by Bergk, in his *Lyrici Poeta Græci* (Leip. 1878.)

COR'INTH, a city and co. seat of Alcorn co., Miss., near the Tennessee border; on the Mobile and Ohio and the Memphis and Charleston railroads. Pop. '90, 2111. During the war of the secession, this was a place of much importance, and was early occupied by the confederates. After the battle of Shiloh, Beauregard retreated to Corinth, followed by the unionists under Halleck. After some time spent in what went by the name of "the siege of Corinth," the confederates retreated, and Corinth was occupied by the union forces. Oct. 3, 1863, the confederates undertook to recapture the place; but on the 4th they were signally defeated in an attempt to carry it by assault, were routed, and fled in disorder. The union loss was 355 killed, 1841 wounded, and 324 prisoners; that of the confederates, 1423 found dead on the field, probably 5000 wounded, and 2248 prisoners.

COR'INTH (originally called *Ephyre*), a famous city of antiquity situated on the isthmus connecting the northern division of Greece, or Hellas proper, with the Peloponnesus. Its citadel was the Acrocorinthus, an isolated hill 1886 ft. high, separated from the Oneian range on the n. of the isthmus by a ravine, and forming, in the opinion of Col. Mure, the most gigantic natural citadel in Europe, neither the Acropolis of Athens nor the fortress of Gibraltar being able even remotely to compete with it. At the northern foot of this hill lay the city of C., on a broad level rock nearly 200 ft. above the level of the isthmus. It was probably founded by the Phenicians, who had various settlements on the Grecian coast, and who could hardly have failed to notice the extraordinary maritime advantages of its situation. According to its legendary history, however, it was founded by Sisyphus, the Æolian, about 1350 B.C. It was then conquered by the Heracleidæ, who ruled as an oligarchy for twelve generations, when they were expelled by Cypselus, the father of Periander, with the help of the populace, 657 B.C. After a period of 77 years, the Spartans—the great enemies of democracy in Greece—established again a sort of aristocratic government, and C. now figures in history as the close ally of Sparta. In the Peloponnesian war, it at first furnished the greater part of the fleet employed against the Athenians, but afterwards became jealous of the Lacedemonian power, and was induced to league with other Grecian states against it, 395 B.C. The war which ensued is known as the *Corinthian war*, and lasted till the peace of Antalcidas, 387 B.C. In the strife which broke out between Thebes and Sparta, C. remained faithful to the latter. After the battle of Chæroneia, 338 B.C., in which the liberties of Greece were crushed by the Macedonians, it was garrisoned and held by the latter. Subsequently, it was the center of the Achean league formed against the Romans and in revenge was utterly destroyed (146 B.C.) by L. Mummius, the Roman general. For a whole century it continued in ruins. In 46 B.C., Julius Cæsar rebuilt it, and made it the capital of Achaia; and although it never again attained its former importance, it became both prosperous and powerful. St. Paul planted a Christian church here, to which he also addressed two epistles. Pausanias, who visited it in the 2d c. A.D., states that it then contained many public buildings. From the western emperors it passed into the hands of the Venetians. In 1458 A.D. it was conquered by the Turks under Mohammed II., recovered by the Venetians in 1687, and retaken by the Turks in 1715, who held it till 1823. Reduced to ashes in the revolutionary war, and again utterly destroyed by an earthquake in 1858, C. is now being rebuilt in a more convenient position near the shore of the gulf of Corinth. Its pop. in 1889 was about 5000.

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Ancient C. was surrounded by walls which included the Acrocorinthus, and had two harbors—*Lechæum*, on the Crissæan bay (now the gulf of Lepanto), opening into the Adriatic; and Cenchreæ, on the Saronic gulf (now the gulf of Athens), opening into the Ægean. The former was connected with the city by two parallel walls. The vast wealth of its merchants was the bane of Corinth. It became notorious as the most licentious city in all Greece, and was the favorite resort of courtezans. The patron goddess of the city was Aphrodite, in whose temple, on the Acrocorinthus, were kept more than a thousand "sacred female slaves" (*hierodouloi*) for the use of strangers. C., however, has better claims to remembrance. The art of painting is said to have been invented here, and at the time of its capture by the Romans, it possessed some of the finest pictures in Greece. Among these was the picture of Bacchus, by Aristides, for which Attalus offered 600,000 sesterces. Architecture, statuary, and bronze-work also flourished, and earlier, during the reign of Periander, poetry was cultivated, Arion having either invented or improved the dithyramb in Corinth. Afterwards, however, no attention was paid to literature by the inhabitants, and it has been noticed that "among the illustrious writers of Greece not a single Corinthian appears."

CORINTH, Gulf of, or Gulf of Lepan'to. An arm of the Mediterranean extending from w. to e. through the center of Greece, from the Ionian to within about 5 m. of the Ægean sea, thus almost dividing the kingdom into two parts, the Morea forming the southern portion. Its greatest length is about 75 m., with an average breadth of 15 miles. The outline of the coast is exceedingly varied, and the scenery is everywhere as attractive as it is rich in contrast. The narrow neck of land which separated the gulfs of C. and Egina, and united the Morea to Attica, was called the Isthmus of Corinth. It was variously estimated, according as it was measured from different points, at from 10 to 20 m. in length, and its breadth varied from 4 to 8 miles. The project of cutting through this isthmus, in order to unite the Ionian and Ægean seas, was begun under Nero, but abandoned. To protect the Morea from land attack, however, a strong wall, flanked with towers, was built across the isthmus, and traces of it may still be seen. After an interval of 1800 years the canal was constructed (1882–93). It is 4 m. long, and accommodates the largest ships. The celebrated Isthmian Games were contested upon this tract.

CORIN'THIAN ORDER, the latest developed of the three orders of Greek architecture, consisting of three parts—stybolate, column, and entablature, and distinguished by its beautiful ornamentation, in which the conventionalized honeysuckle and acanthus are conspicuous. The Roman Corinthian order has a loftier stybolate, a steeper pediment, and other variations, especially in the capital. See Column.

CORINTHIANS, EPISTLES to the, were written by St. Paul, 54 to 58 A.D. The first was composed at Ephesus; the second, according to general opinion, at Philippi, but this is doubted by many scholars. From a passage in what is called the first epistle—"I wrote to you in the epistle"—many have inferred that an earlier letter had been sent by the apostle to the church of Corinth. The weight of evidence, however, is against that opinion. The genuineness of the first epistle has never been doubted, and it is attested by the earliest and most abundant proof. The most probable date assigned to it is A.D. 54. It was occasioned by the divisions, immoralities, and disorders which, the apostle had heard, were existing in the church; and by the request of the church for instruction and advice. The epistle, therefore, naturally consists of two parts: the first applying remedies, and the second answering questions.

In the first part, the apostle expresses pleasure and thankfulness, in view of the abundant spiritual gifts which the Corinthian Christians had received. (1.) He then proceeds to rebuke their divisions, and to give the reasons why they and all Christians should be united in Christ and among themselves. (2.) He condemns sharply the immorality which some of them practiced, and the indifference to it which many of them showed. Both the crime and the insensibility to its guilt had their origin in the corruption universal among the Gentiles, and so developed at Corinth that "to Corinthianize" was a synonym for licentiousness, and that all who had any remnant of prudence or of shame felt that Corinth was no place for them. Hence it followed that even true converts began their new life in an atmosphere of which we can have only the faintest idea, now that the Gospel has been waging war against corruption for 1800 years.

In the second part, the questions submitted by the church are answered. They had reference (1) to marriage and celibacy; (2) to the lawfulness of eating meats sacrificed to idols; (3) to the decorum of manner proper for both men and women in religious assemblies; (4) to the impropriety in their observance of the Lord's supper, which, like the immorality already spoken of, was the effect of their birth and training amidst the disgraceful practices of idolatrous festivity; (5) to unbelief in the resurrection of the dead; and (6) to the estimate in which spiritual gifts should be held. On all these points, principles are announced and arguments enforced which, while meeting the difficulties and errors then prevalent, have also a general application. At the close of the epistle, directions are given for contributions, and salutations are sent to the members of the church.

The genuineness of the second epistle has been as generally admitted as that of the first; and it is equally well attested by both external and internal proofs. It was written soon after the first, as a sequel to it, and probably from Philippi. Having been informed by Titus of the effects produced by his reproofs and instructions, Paul was

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comforted and encouraged, yet saw that the reformation had been only partial. Many of the Corinthians had amended their lives; many were deeply penitent; a grievously offending member of the church had been expelled, and renewed respect for the apostle had been shown. Some, however, still under the influence of false teachers, denied the divine authority of the apostle's ministry, and endeavored to turn his letter against himself. They charged him with vacillation of purpose, with severity, with vainglory, and even urged against him personal infirmity as an offset to official power. The second epistle was written to meet these circumstances of the church. In it the apostle (1) answers the charge of vacillation, affirming that his delay in visiting them had been caused by the persecution to which he had been subjected, and by his desire to afford them longer time for perfecting the reformation which they had begun. (2) He assures them that, so far from having been tyrannical or severe in his discipline, he earnestly desired the welfare both of the church and of the particular offender, and that as the good effect of the sentence of excommunication had been manifested, he hoped that it would no longer be enforced. (3) He ascribes the great success of his ministry altogether to the power and grace of God. He acknowledges his own personal unworthiness and weakness, but appeals confidently to the abundant testimony which God had given to his work in preaching the gospel and establishing the church. Nowhere had this divine support been more triumphantly displayed than among the Corinthians themselves; and it would continue to be given, however contumacious any of them might be. (4) He renews his affectionate exhortations to a holy and beneficent life.

CORIOLAN'US, CAIUS or CNÆUS MARCIUS, a Roman patrician, surnamed, according to the half-fabulous legend, C., on account of his capture of the town of Corioli, belonging to the Volsci (493 B.C.). Of a proud and haughty spirit, he was strongly opposed to the plebeians, whom he looked upon as the "enemies" of his order; and on one occasion, during a time of famine, he argued in the senate against a gratuitous distribution of the corn which had arrived from Sicily, and insisted that the plebeian tribunes, lately instituted, should first be discharged from office. For this he was impeached and banished. He took refuge among the Volscians, whom he aided in their war with the Romans. His victories at the head of his Volscian troops alarmed the Romans, who, on his approach to their city, sent a variety of deputations to plead with him. He was deaf to every entreaty. At last, the noblest matrons of Rome, headed by his old mother and his wife, Volumnia, leading her two children, came to his tent. His burning desire to be revenged on those who had dishonored him was cooled by the tears of his relatives, and he led back the Volsci to their own territories, where he lived to an advanced age. Shakespeare has written a play on the subject, in which the character of C. is conceived in the grandest and most aristocratic style.

CORIP'PUS, FLAVIUS CRESCONIUS, a native of Africa, supposed to have lived in the 6th c.; author of a panegyric on Justin the younger, Byzantine emperor from 565 to 578 A.D. Corippus was also the author of *Johannis*, a poem celebrating the exploits of a proconsul of that name in Africa in Justinian's time.

CORK (Span. *corcho*, from Lat. *cortex*) is the unusually developed *epiphloeum* (see BARK) of the bark of the cork-tree or CORK-OAK (*quercus suber*), the *alcornoque* of the Spaniards, a species of oak (q.v.), a native of the s. of Europe and n. of Africa. Spain and Portugal chiefly supply the world with C., and in these countries the tree is often planted for the sake of the cork. The cork-tree is not of great size, generally 20 to 40 ft. high, much branched, with ovate-oblong evergreen leaves, which are sometimes entire and sometimes sharply serrated. The acorns are eatable, and resemble chestnuts in taste. The bark in trees or branches from three to five years old acquires a fungous appearance, new layers of cellular tissue being formed, and the outer parts cracking from distension, until they are finally thrown off in large flakes, when a new formation of the same kind takes place. C. intended for the market is generally stripped off a year or two before it would naturally come away, and the process is repeated at intervals of six or eight years. The bark of young trees and branches is either useless or of very inferior quality; it is only after the third peeling that good C. is produced. The removal of the C., being not the removal of the whole bark, but only of external layers of spongy cellular tissue, all or greater part of which has ceased to have any true vitality, and has become an incumbrance to the tree, is so far from being injurious, that, when done with proper care, it rather promotes the health of the tree, which continues to yield crops of C. for almost 150 years. In stripping off the C., longitudinal and transverse incisions are made to the proper depth, and each piece is then cut away from the tree by a curved knife with two handles. The pieces are soaked in water, pressed flat, dried, and superficially charred, to remove decayed parts and conceal blemishes, before they are packed in bales for the market. Besides the use of C. for stopping bottles, casks, etc., it is much used, on account of its lightness, for floats of nets, swimming-belts, etc.; and on account of its impermeability to water, and its being a slow conductor of heat, inner soles of shoes are made of it. All these uses are mentioned by Pliny; but the general employment of corks for glass bottles appears to date only from the 15th century. The *Spanish black* used by painters is made by burning C. in close vessels, and the parings of C. are carefully kept by cork-cutters for this purpose. There are many other applications of this valuable substance in the arts, which cannot here be detailed.

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The C. tree is occasionally planted in the s. of England, but the climate is not sufficiently warm.

The wood of some trees possesses the cellular sponginess, lightness, and elasticity of C. in such a degree as to be sometimes substituted for it in many of its uses, as that of the *anona palustris* (corkwood, or alligator apple) in the West Indies, etc.

CORK-CUTTING. The bark, after being cut into square pieces or sheets, is pressed, to remove its natural curvature and flatten it. If it is found that simple pressure has not flattened it sufficiently, it is heated on the convex side, and the contraction thus produced straightens it. It is then cut into slips, and these slips into squares, according to the required size of the corks. These are rounded by the cork-cutter by means of a broad sharp knife; the cork is held in the left hand, and rested against a block of wood, and the knife pushed forward, and at the same time its edge is made to describe a circular curve by a skillful turn of the wrist. The knife requires continual sharpening; the workman has a board before him on which the knife is rubbed on each side *after every cut.*

Many attempts have been made to cut corks by machinery. A patent cork-cutting company was established a few years since, but it failed. The chief difficulty in applying machines to this purpose arises from the necessity of continually sharpening the knife or cutters, for it is a curious fact, that so soft a substance as cork blunts the tools used in cutting it far more rapidly than do the hardest or toughest of metals. A cork-cutter's knife requires sharpening every second, while the tool that is used for planing, turning, or boring steel will work continously for hours without sharpening. In most of the machines, the corks, after being cut into squares of the required length, are made to revolve on grasping spindles; and cutters of various forms, such as revolving cutter-wheels, hollow cones with internal cutters, reciprocating blades, toothed cutters, etc., are brought to bear upon the revolving cork.

CORK, a maritime co. in Munster, the southmost and largest of the Irish counties. It is bounded on the n. by Limerick, e. by Tipperary and Waterford, s. by the Atlantic, w. by Kerry. Greatest length from e. to w., 110 m.; greatest breadth, 70; average, 84. Area, 1,838,921 acres, exclusive of 10,764 acres under large rivers and tideways. C. is hilly, with great variety of surface. The w. part is rocky, mountainous, wild and boggy, the e. and s., rich, fertile, and picturesque. The ranges run e. and w., except the Boghra mountains, between the Lee and Blackwater. The coast is bold and rocky, and from its indentations, 250 m. long; the bays, which run 3 to 25 m. inland, admitting large vessels. The chief bays are Bantry, Dunmanus, Clonakilty, Kinsale, Cork harbor, and Youghal. There are many isles off the coast, the chief being Whiddy (in Bantry bay), Bear, Innissherkin, Great island, and Cape Clear, which lies in lat. 51° 25′ n. and long. 9° 30′ w., and, with the exception of a rock 4 m. to the s.s.w., is the southmost point in Ireland. In the w., C. is divided from Kerry by a range of Silurian clay-slate, running n.e. and n., the chief points being 1,200 to 2,200 ft. high. This range sends offshoots to the e., which divide the county into the parallel basins of the three chief rivers of C., the Blackwater, Lee and Bandon; the lower parts of these basins are well cultivated and productive. The basins of the Lee and Bandon consist of red and yellow Devonian sandstone, with some beds of lower carboniferous limestone. This limestone, as in other parts of Ireland, forms the largest lowland tracts and valleys of the county. The Blackwater basin also consists of Devonian strata, but with more limestone. Part of the Munster coal-field occupies 400 sq. m. in the n.w. of the county, with a cold, stiff, moory soil over it. The river-beds generally mark the limestone tracts. C. has many small lakes in the west. One of these lies at the source of the Lee, amid wild, picturesque scenery, with the ruins of a chapel on an islet frequented by pilgrims. The chief mineral productions are coal and iron, copper, limestone, fine dark-gray and also red marble rich in fossil shells, fullers' earth, brick-clay, marl. Slate is quarried at Drimoleague. There is a thermal magnesian spring at Mallow. The climate is moist, but genial. The soils are calcareous, loamy, and moory. The dairies are extensive, and C. butter stands in high estimation. The cattle are small in size, but yield large quantities of milk. Pop. '51, 653,180; '81, 495,607; '91, 438,432. C. co. returns seven members to parliament, besides two for C. city. The antiquities of C. are stone circles and altars, two round towers, circular earthworks or raths; many ruins of abbeys and churches, chiefly built by descendants of the English invaders under Henry II., and many ancient castles or square towers of great historical interest.

CORK, a city and parl. borough of Ireland, capital of the county of the same name, and a county in itself, on the Lee, 11 m. above its discharge into the sea, stands in the center of a picturesque valley. It is built in part on an island, formerly a swamp, which the word *Cork*, *Corcoch*, or *Corcagh* implies; in part, on the n. and s. slopes of the river-banks. Many bridges cross the river to the central islands. There is a public park of 240 acres which has been converted into a racecourse. There is also a handsome public cemetery. The situation is picturesque from the uneven ground, irregular streets, intersecting river, and overhanging heights. It is the seat of a Roman Catholic bishop. There are monasteries of the Augustines, Franciscans, Dominicans and Capuchins, and two nunneries. Among the other buildings of note are the bishop's palace, and Queen's

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College, the latter, one of the colleges affiliated to the royal university of Ireland, and occupying a fine Tudor-Gothic quadrangular building, which was opened in 1849. The church of St. Anne Shandon, with its high tower, is near the site of the old Shandon castle, once a stronghold of importance. The banks of the Lee, above and below C., are richly planted, and studded with villas. The Lee is navigable for a considerable distance above the city, and on the improvement of the navigation the harbor commissioners have expended large sums. C. harbor is noted for its size and safety, and is formed by the estuary of the Lee It could contain the whole British navy, and has been the main source of the rise and progress of the city. It has dry docks, and patent slips. The estuary contains several large isles, rising abruptly, and high above the water, with narrow channels between them. It is a land-locked basin, having an entrance one mile in width, which is defended by batteries on Spike, Hawlbowline, and Rocky islands, which are also occupied by convict and ordnance depots and artillery barracks. On the shores of the estuary are the towns of Passage and Queenstown, formerly Cove of Cork. Among the manufactures of the city may be mentioned, leather, metallic goods, tweeds, ginghams, friezes, linens, beer and whisky. The chief exports are butter, iron, whisky; linen, grain, and other Irish produce. Pop. '91, 75,345; parliamentary borough, 97,300, of whom the great majority are Roman Catholics. C. returns two members to parliament.

CORK, Rock. See Asbestus.

CORLEONE, a t. of Sicily, in the province of Palermo, about 21 m. from the city of that name. It is situated on a hill near the source of the Belici, and is well built, Its principal public structures are convents and churches. Its inhabitants, about 17,000 in number, are chiefly engaged in agriculture.

CORLISS, George Henry, b. Easton, Washington co., N. Y., 1817; removed to Providence, R. I., 1844, engaging in the manufacture of steam-engines, and in 1848 established the Corliss Steam Engine Co. He made and patented many improvements in steam-engines, and in 1876 furnished the famous "Corliss Engine" to Machinery Hall in the Philadelphia centennial exhibition. This engine now furnishes the motive power for the works of the Pullman Car Co., in Pullman, Ill. He d. in 1888.

CORM (Gr. *kormos*, a stump)—sometimes called a *solid bulb*—the short and bulb-like subterranean stem of many endogenous plants. It annually produces buds in the form of small corms, either from its summit or its side; and these gradually exhaust and destroy it. In functions, as in appearance, the C. resembles the bulb (q.v.), but its structure is different; it does not consist chiefly of scales, as a bulb does, but of a solid axis covered only with thin membranes. Examples may be seen in the tulip, crocus, gladiolus, colchicum, and arum. When a C. produces young corms from its summit, as in the crocus, they approach in a few years the surface of the soil, however deeply they may at first have been planted.

CORMENIN, Louis Marie de la Haye, Vicomte de, a distinguished French jurist and publicist, was b. at Paris, Jan. 6, 1788. Educated for the law, he was, in 1810, appointed auditor of the council of state, and drew up several of its most important reports. He was elected a deputy in 1828, and from that time until 1846, continued to be re-elected at every election, sometimes by as many as four departments at once. His extensive knowledge of jurisprudence, and of the practical affairs of government, and the clear and logical force with which he could present his ideas alike by speech and writing, soon secured him an immense influence in public affairs. After the revolution of 1848, C. had the honor of being elected to the chamber by four departments, and was nominated president of the commission appointed to remodel the constitution; and in this capacity strongly advocated universal suffrage. He was appointed member of the council of state reconstituted after the *coup d'état*. In 1855, he was elected a member of the Institut. Besides his numerous pamphlets, C. is author of *Etudes sur les Orateurs Parlementaires*, a work which has passed through nearly twenty editions; and of a valuable work on the law of France (*Droit Administratif*). After long silence, C. published, in 1860, *Le Droit de Tonnage en Algérie*. He died at Paris, 6th May, 1868.

CORMON, Fernand, painter, b. in Paris, 1845, studied under Fromentin, Cabanel, and Portaels. He became an officer of the Legion of Honor in 1889. His work is on historical and archæological subjects, and he has been successful also in the painting of portraits. In his archæological paintings, of which "The Stone Age," exhibited in 1884, is a good specimen, he shows great accuracy in reproducing the characteristics of the time, having given much study to the scientific accounts of ancient and prehistoric periods. Other works worthy of special mention are "Cain" (1880), and "The Victors of Salamis" (1887).

CORMONTAIGNE, Louis de, 1696–1752; a French military engineer who took part in some of the most important sieges in the Polish and Austrian wars. He had charge of the line of fortification from Calais to the Rhone, and he built new defenses at Strasburg, Metz, and Thionville.

CORMORANT (*phalacrocorax*; Fr. *cormorant*; Ital. *corvo marino*; Bret. *morvrau*, a sea-crow; Welsh, *mor*, sea, and *brau*, a crow), a genus of web-footed birds of the family *pelecanidæ* or *totipalmati*, having, like the rest of that family, the hind-toe united in a

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single membrane with the other toes; and also characterized by a bare dilatable membrane beneath the lower mandible, extending to the upper part of the throat, but not forming a great sac on the throat, as in the pelicans; a compressed bill, rounded above, and with a strong hook at the point of the upper mandible; the nostrils linear, and seemingly impervious to air; the claw of the middle toe serrated, apparently in order that it may be used in trimming the plumage; the wings of moderate length; the tail-feathers stiff and rigid, and used to aid in walking or climbing. The species are distributed over the coasts of most parts of the world, some of them occasionally ascending rivers in pursuit of fish, on which all of them exclusively live, and even visiting inland lakes. They are proverbial for their excessive voracity. They do not take their prey by diving when on wing, but pursue it by swimming and diving, using their wings in progress under water, and descend to a wonderful depth; the smaller of the two British species has been caught in a crab-pot fastened 120 ft. under water. When the prey has been caught in a manner inconvenient for swallowing, they toss it in the air, and adroitly catch it as it descends. Some of the species frequent high rocks, others low islands, on which they make rude nests, chiefly of sea-weed; some perch and even build their nests on mangroves and other trees. Their eggs are covered with a calcareous incrustation. The flesh of all the species is dark and of a fishy taste, but is sometimes used as food, particularly that of young birds. The British species are the common C. (*P. carbo*), which is mostly of a black color, but for a short time during the breeding-season exhibits a sprinkling of longish white, almost bristly feathers on the head and back of the neck; and the green C. or shag (*P. graculus*), which is of smaller size, and of a prevailing dark-green color. The common C. is about 33 in. long. It is a very widely distributed species. It was formerly sometimes tamed in England, to be employed in catching fish, and is still trained to this use in China.

CORN (Ger. *korn*) meant primarily any small, round, hard body, like a seed. This general meaning is still seen in its application to concretions on the feet. It is allied to the Lat. *granum*, grain; and to Ger. *kern*, kernel. As usually applied, C. is a generic name for all seeds used in making bread, especially the seeds of cerealia. But it has also a specific sense, and denotes in any country that grain which furnishes the prevalent breadstuff of the people. Thus, in England, C. means *wheat;* in America, it means *maize;* and in Scotland, *oats*. See MAIZE.

CORNA'CEÆ, a small natural order of exogenous plants, containing about 40 known species, chiefly trees and shrubs, with a few herbaceous plants. The leaves are simple, without stipules; the flowers in heads, umbels, or corymbs. The calyx is 4-lobed or 4-toothed; the petals 4, equal, oblong, broad at the base, inserted into the upper part of the tube of the calyx; the stamens 4, alternate with the petals; the ovary is adherent to the tube of the calyx, 2 to 3-celled, crowned by a disk; the ovules solitary; the style filiform; the stigma simple; the fruit is fleshy and drupe-like. The C. are natives of the temperate parts of the northern hemisphere. The fruits of some are eatable; the bark and leaves of some are medicinal; some are valued as ornamental plants. CORNEL, DOGWOOD, AUCUBA, and BENTHAMIA are examples.

CORN APHIS, or WHEAT APHIS, *Aphis granaria*, a species of *aphis* (q.v.), or plant louse, which is sometimes injurious to corn-crops, appearing in great numbers on the ears, sucking the juices of the plant, and so impoverishing the grain. It infests wheat, barley, and oats. The male is green, the female dull orange.

CORNA'RO, CATERINA, 1454–1510; a queen of Cyprus. She succeeded her husband, who had acted as regent until 1478. After a troubled reign of 16 years, she abdicated in favor of the Venetian republic. Titian painted her portrait, and her history has been a favorite study for romance writers.

CORNA'RO, LODOVICO, a Venetian nobleman, b. 1467, is remembered on account of his instructive example of temperance. His constitution, naturally not strong, was greatly injured by intemperate eating and drinking, with other excesses; so that, when 40 years of age, he appeared to have little hope of prolonged life. At this time he adopted strict rules of temperance both in meat and drink, which, co-operating with his general care of health and gentle exercises of various kinds, served to extend his life to nearly 100 years, as he died, according to the best authorities, in 1566. His old age was remarkably cheerful. To promote those habits which had proved so advantageous in his own case, he wrote, in his 83d year, his celebrated treatise, *Discorsi della Vita Sobria* ("Essay on Temperate Living"), which was first published at Padua in 1558, and has been translated into all European languages. The best English translation is one bearing date 1779.

CORN BEETLE, *Cucujus testaceus*, a minute beetle which inhabits granaries and mills, and of which the larva often does much mischief, feeding, like the weevils, on grain, particularly on wheat. The perfect insect is of a bright fulvous color; the larva ocherous, with a forked tail.

CORNBRASH, a member of the lower oolite, consists chiefly of a rubbly cream-colored limestone in thin layers, always nodular and concretionary, each fragment having a deep red coating. Occasional beds of clay occur interstratified with the limestone. The whole thickness of the group rarely exceeds 15 feet. The C. is extremely rich in

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echinodermata and mollusca, with the exception of cephalopoda, the abundant oolite genus belemnites being unaccountably wanting.

CORNBURY, Edward Hyde, Lord, d. 1723. He was grandson of Edward Hyde, first earl of Clarendon, and one of the earliest among the household troops to desert from the service of James II. William III. made him governor of the province of New York, where he arrived in May, 1702. His administration was rapacious and disgraceful, and after six years he was removed. He was for a long time under arrest by his creditors, but was relieved on the death of his father, when he succeeded to the title and estates.

CORN CRAKE. See Crake.

COR'NEA, one of the coats of the eye; so called from its resemblance to horn (Lat. *cornu*). See Eye.

CORNEILLE, Pierre, the creator of French tragedy, was b. June 6, 1606, at Rouen, where his father was an advocate. He himself studied for the legal profession. A love adventure, in which he became the rival of a friend, first prompted C. to write verses, and *Mélite*, the comedy founded on this incident, was performed with success in 1629. It was quickly followed by other dramatic pieces: *Clitandre; La Veuve; La Galerie du Palais; La Suivante;* and *La Place Royale*—all so successful that a special theatrical company was formed for the performance of C.'s pieces. In 1635, appeared his *Médée*, a declamatory drama, written in imitation of Seneca. Cardinal Richelieu, who aspired to be the Mæcenas of the stage, kept in his pay a number of writers for whom he dictated plots, and wished to number C. among his retainers; but C. was so audacious as to alter the plan of a comedy, and thus lost the cardinal's favor. He now returned to his native place, where M. Chalon, once secretary to Maria de' Medici, suggested that he should turn his attention to tragedy. As the English drama was not known, or at least not relished at that time beyond the limits of England, C. acquired the Spanish language that he might be enabled to study the Spanish drama, the only other of any consequence in Europe. The result was the *Cid* (1636), which was received with enthusiastic applause. Cardinal Richelieu alone seemed to find no merit in this drama, and induced the academy to publish a critique in some respects unfavorable. In his next celebrated piece, *Horace* (1639), C. endeavored to vindicate his claim to creative genius, which had been questioned by his enemies; but *Cinna* (1639) has been regarded by some French critics as C.'s masterpiece, though others might be disposed to award this honor to *Polyeucte* (1640). In the *Mort de Pompée* (1642), though there is something dignified in the style, it occasionally passes into bombast. The comedy of *Le Menteur* (1642), partly taken from Pedro de Roxas, has natural truth and humor. C. now seems to have exhausted his resources, and his later pieces are almost all forgotten. Of his thirty-three dramas, only a few have kept their place on the French stage. Nevertheless, his countrymen call him *Le grand Corneille*, although Voltaire, who edited an edition of his works, and Laharpe have expressed themselves in some respects unfavorably regarding his genius. The faults of conception in several of his pieces were pointed out by the sharp criticism of Lessing. A. W. Schlegel also spoke in such a way as to provoke hot replies from the wounded pride of the French littérateurs. C.'s chief merit lies in his dignity of style, and in a certain declamatory grandeur of sentiment, which his countrymen have been accustomed to consider truly epical, and which it is now impossible to convince them as nearly resembles rant as it does sublimity. C. died Oct. 1, 1684. The best edition of his complete works was edited by Renouard (12 vols., 1817).—C.'s brother, Thomas (born 1625—died 1709), also acquired a reputation as a dramatic writer.

CORNEILLE, Thomas, 1625–1709; brother of Pierre, and 20 years younger. At an early age he developed a facility for rhyming, and naturally followed his brother's steps. From about his 22d year he produced plays in rapid succession, occasionally with the help of Pierre, but for the most part alone. At his brother's death, he succeeded to the vacant chair in the academy. He then turned his attention to philology and translation, producing a dictionary intended as a supplement to that of the academy. This was followed by a complete translation of Ovid's *Metamorphoses*. Seven years afterwards he lost his sight, but this did not stop his work, for he soon produced in three folio volumes a *Geographical and Historical Dictionary*. Some of his works were remarkably successful. His *Timocrate* had the longest run of any play in the century, and for *La Dévineresse* he received 6,000 livres, the largest sum known to have been paid by an author from a single piece; and finally one of his pieces, *Le Baron des Foudrières*, had the distinction of being hissed off the stage.

COR'NEL, or Corne'lian Cherry, *Cornus mas*, the *cornus* of the ancients, a tree or shrub of 15 to 20 ft. high, of the natural order *cornaceæ*, a native of the middle and s. of Europe, and of great part of Asia. It is not found wild in Britain, although it is common in shrubberies, and was formerly much cultivated as a fruit-tree, as it still is in Germany and other parts of Europe. It has oval leaves, and small yellow heads of flowers, which appear before the leaves in spring, and which abound in honey, and are much frequented by bees. The fruit is oblong, a little larger than a sloe, shining, red, or rarely yellow or white. It is late in ripening, and until quite ripe is very austere; but when perfectly mellow, has an agreeable vinous acid taste. it is either eaten as

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it comes from the tree, or is made into a preserve, which is said to be tonic, and useful in diarrhea. When gathered unripe, it is pickled like olives. It was formerly also fermented for a beverage In Turkey, it is still much used in making sherbet. The wood of the C. is extremely hard and tough, and well adapted for those purposes of joiners and turners to which the size of the tree will admit of its application. It is used for making mathematical instruments.—DWARF C. (*C. suecica*), a native of mountain-pastures and bogs throughout the n. of Europe and in Britain, is a plant about six inches high, with creeping root, sessile ovate leaves, each stem producing a single umbel of a few purple flowers, followed by small sweetish red fruit, which is tonic, and has the power of remarkably increasing the appetite, whence the plant has received a Gaelic name, signifying *plant of gluttony*.—Dogwood (q.v.) belongs to the same genus.

CORNELIA, one of the greatest women in Roman history, was the younger daughter of Scipio Africanus the elder, the conqueror of Carthage, and mother of the great tribunes, Tiberius and Caius Gracchus, and of Cornelia, the wife of Scipio Africanus the younger. On the death of her husband, refusing numerous offers of marriage, including even one from king Ptolemy, she devoted herself to the education of her children, a task for which her lofty spirit and wide attainments rendered her admirably fitted, and which had extraordinary results. The only attack ever made upon her lofty reputation was the charge that she was concerned in the death of her son-in-law, Scipio, which was, there is no reason to doubt, a base slander. On her death a statue was erected to her memory bearing the inscription—"Cornelia, Mother of the Gracchi." To a Campanian lady who asked to see her jewels, she is said to have presented her sons as the only jewels of which she could boast. After the murder of Caius, the second of her sons, she retired to Misenum, where she devoted herself to Greek and Latin literature, and to the society of men of letters.

CORNELIUS, ELIAS, D.D., 1794–1882; a native of New York, graduated at Yale, 1813, and studied theology under pres. Dwight, and afterwards under Dr. Lyman Beecher. He was licensed to preach in 1816, and was appointed agent for the American board of commissioners for foreign missions. He was sent to the southern states to raise funds to establish missions among the Indians, and while on his way to the Chickasaw nation he redeemed, from a band of Cherokees, a white girl, whose mother had been killed. He provided for the child, and subsequently wrote her history in *The Little Osage Girl*, which became a popular Sunday-school book. From 1819 to 1826, he was pastor of a Congregational church in Salem, Mass., and in the latter year was appointed secretary of the American education society. In 1829, he was chosen professor of divinity in Dartmouth college, but he declined the place. In 1832, he became secretary of the American board of commissioners for foreign missions.

CORNE'LIUS, PETER VON, one of the first masters of the modern German school of painting, was b. at Düsseldorf, 23d Sept., 1783, and studied under Langer in the academy of his native town. He went to Rome in 1811, and won recognition by two cartoons, "Joseph's Interpretation of the Dream," and "Joseph's Recognition of his Brethren." In 1819 he was called to Munich, and entered the service of the then crown-prince of Bavaria. Here he remained till 1841, and executed the large frescoes in the saloon of the Glyptothek, all illustrating stories of the Greek gods and heroes, a series of frescoes of New Testament scenes which decorate the "Ludwig's church" in Munich, which was built for the purpose of affording scope for the genius of Cornelius. The "Judgment" is larger even than Michael Angelo's "Judgment" in the Sixtine gallery. In 1841, C. was invited by the king of Prussia to Berlin, where he was appointed director of the Berlin academy. Among his productions in the Prussian capital are the frescoes for the Campo Santo, or royal burial-place. Opinion is divided regarding the merits of Cornelius. By his own countrymen he is extremely admired; French critics, on the other hand, regard him as more a thinker than an artist, sacrificing to his conception both truth of color and expression. He is admitted to have been a profoundly creative genius, but *not* a painter. He formed, however, a numerous school, from which have gone forth many illustrious pupils; but he lived to see it losing hold on public sympathy. He died in the 80th year of his age, 6th March, 1867.

CORNELIUS NEPOS. See NEPOS.

CORNELL', EZRA, 1807–74; founder of the Cornell university at Ithaca, N. Y. He was b. in Westchester co., N. Y., and was among the earliest to appreciate the great value of the electric telegraph, in the promotion of which he accumulated a large fortune, the greater portion of which went toward the establishment of the noble institution bearing his name. His son, ALONZO B., was elected governor of New York in 1879, holding office for three years.

CORNELL COLLEGE, at Mount Vernon, Iowa, was founded in 1852. It is under the control of the Upper Iowa and Northwest Iowa conferences of the Methodist Episcopal church. It has a faculty of thirty, giving courses in classical, philosophical, scientific and civil engineering branches, and has an art school, a conservatory of music, a preparatory academy. An officer of the U. S. Army gives instruction in military tactics.

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The college has museums, laboratories, gymnasium, and a library of 15,000 volumes. Bowman Hall has recently been built for women students. In 1896–7 the students numbered 569, of which 280 were in the college. The college has five buildings and athletic grounds at Ask Park in the vicinity. The president since 1863 has been the Rev. Wm. F. King, D.D., LL.D. Literary, scientific and religious societies help to create a good social and spiritual life.

CORNELL UNIVERSITY, at Ithaca, N. Y., was founded in 1868. It is non-sectarian, its charter providing that at no time shall the majority of trustees be of one religious sect or of no religious sect. Its foundation was partly the land-scrip, representing 990,000 acres, received by the state of New York from the national government under the land grant of 1862; partly a donation of $500,000 and 200 acres of land by Mr. Ezra Cornell. Mr. Cornell's later gifts bring the aggregate of his benefactions to $670,000. The total endowment is about $10,000,000, the annual income $500,000. For purposes of instruction the University makes use of 17 buildings, the average cost being $100,000. The library aggregated in 1896 some 190,000 bound vols. and 30,000 pamphlets. Of this number 25,000 vols. composed the law library and included the famous Moak library of court reports. The library receives regularly 590 literary and scientific periodicals, and the shelves of its reading room, which seats 220 readers, presents to unhampered use for purposes of reference a selected library of 8,000 volumes. The most notable of the many special collections are the President White Historical Library of 20,000 volumes, especially rich in primary sources of the history of the Reformation, the English and French Revolutions, the American Civil War, and the history of superstition; the Dante collection of (1897) 6,000 vols. given by Mr. Willard Fiske, and forming much the largest Dante library outside Florence, Italy; and the Zarncke library of 13,000 vols. of Germanic philology and literature, presented by Mr. William H. Sage. There are 12 seminary rooms, 13 museums, and 19 laboratory buildings, some of very large size, as the Chemical Laboratory, which contains between 20 and 30 laboratory rooms for different branches of chemical research. The museum of classical archæology contains the finest collection of casts representing Greek and Roman art, owned by any educational institution outside Germany. The total attendance is about 2,000; of whom 1,000 are New York students. The staff of instruction comprised, in 1896, 175 professors and instructors and about 50 non-resident lecturers. The University comprises the following divisions: 1. the Graduate Department (degrees A. M., Ph. D., etc.); 2. the Academic Department, or Department of Arts and Sciences (degree A B.); the Sibley College of Mechanical Engineering and Mechanic Arts (degree M. E.); the College of Civil Engineering (degree C. E.); the College of Law (degree LL.B.); the College of Architecture (degree B. Arch.); the College of Agriculture (degree B. S. A.); and the New York State Veterinary College (degree D. V. M.). The University does not grant honorary degrees. The instruction includes some 275 courses of study in Semitic languages and literatures, classical archæology and art, comparative philology, Greek, Latin, Germanic and Romance languages, English, philosophy, history, political science, bibliography, mathematics, astronomy, physics, chemistry, botany, and arboriculture, invertebrate zoology, physiology, mineralogy, paleontology, etc.; 45 strictly technical courses in mechanical, electrical, marine, and other branches of mechanical engineering; 35 in bridge, hydraulic, sanitary, and other branches of civil engineering; 30 in the various branches of the law; 25 in architectural design, building materials and construction, the history of architecture, etc; 30 in animal industry, dairy husbandry, horticulture, etc.; and 25 in veterinary medicine and surgery, bacteriology and pathology, etc. Cornell is a co-educational institution, and although there are no dormitories for men, the women students have for many years enjoyed the use of the Sage Hall for Women. There are no compulsory religious exercises, but on the Dean Sage Preacher Fund the university pulpit is weekly occupied throughout the academic year, by a succession of the most eminent divines of all denominations, and the Cornell University Christian Association, in which men and women, Catholics and Protestants, unite, has a building of its own on the campus. There are established, for the furtherance of scholarship, 512 free undergraduate scholarships for New York state students; 36 competitive undergraduate scholarships of a value of $200 each, and tenable for two years; 22 graduate scholarships, five of the value of $100, and 17 of the value of $300; and 22 fellowships, two of the value of $600 each, and 20 of the value of $500 each. Andrew D. White was president till 1885, Charles Kendall Adams from 1885 to 1892, and Jacob G. Schurman since 1892.

CORNET, a stop or series of pipes, in an organ, intended to imitate the tone of an obsolete wind-instrument which has been superseded by the oboe. The CORNET-A-PISTON, a modern wind-instrument of the trumpet kind, is generally made of brass, has two or three valves, and in brass bands takes the soprano and contralto parts. It was first introduced in France as an orchestral instrument. Its tones are less powerful, but far more easily manageable than those of the trumpet.

CORNETO, a t. of central Italy, about 12 m. n. of Civita Vecchia occupying a commanding eminence on the left bank of the Marta, and 2 or 3 m. from the Mediterranean, over which it has an extensive view. C. rose out of the ruins of the Etruscan city of *Tarquinii*, and is enriched by some of its monuments. It was erected

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into a city by Eugenius IV. in 1432; but the picturesque old battlemented walls and towers which surround it are said to belong to an earlier period. During the faction wars of the Guelphs and Ghibellines, this city maintained a firm allegiance to the popes. Pop. 5,000. The remains of Tarquinii (perhaps the most interesting in existence to the student of Etruscan history, as it is from the tombs here that most of our knowledge as to the games, costumes, and religious customs of this remarkable people has been derived) lie about a mile and a half from Corneto. The Necropolis of Tarquinii covered 16 sq.m., and it has been estimated on high authority that it could not have contained less than 2,000,000 tombs. Of this vast number, some 2,000 have been opened within recent years. Among the most noteworthy of these are the Grotta delle Iscrizioni, the Grotta delle Bighe, Grotta del Barone, Grotta Francesca, Grotta del Cardinale, Grotta del Triclinio, and Grotta della Querciola. Treasures from this mine of Etruscan wealth, as it may be called, enrich the British museum, and other important collections in Britain and on the continent.

CORN FLY, the common name of a number of small dipterous (two-winged) insects, of the large family *muscides*, particularly of the genera *chlorops* and *oscinis*, which do great injury to corn crops. The most destructive in Britain is *chlorops tæniopus*, a fly about a line and a half in length, of a pale-yellow color, with black stripes, which deposits its eggs between the leaves of young plants of wheat or barley. The maggots living on the juices of the plant produce the disease which, from the swelling of the joint, is called *gout;* and the plant, impoverished, either produces no ear, or an imperfect and partially shriveled one.

CORN GROUND BEETLE, *Zabrus gibbus*, an insect of the order *coleoptera*, section *pentamera*. It is about six lines in length, of a shining pitchy black color, with rusty jaws and legs, very broad and convex, the wings large, the antennæ short and slender. It burrows in the ground, climbs the stalks of wheat and barley by night, and devours the ears. The larva is of a remarkable appearance, whitish, with brown head and thorax, and a brown stripe down the body, powerful jaws, six thoracic legs, and little tufts of hair along the sides of its elongated tapering abdomen. It burrows in the earth, and eats the stems of corn close to the surface of the ground.

CORNHERT, OR KOORNHERT, DIEDRIK, 1522–90; a Dutch writer on politics and theology. He was secretary to the burgomasters of Amsterdam in 1564, and active in opposing Spanish tyranny, being the author of the manifesto which the prince of Orange published in 1566. He was imprisoned by the government, but escaped to Cleves, where he maintained himself by his art of engraving on copper. When the states became free he returned, and was made secretary of state. He was a famous theologian, and held controversies with both Roman Catholics and reformers.

CORNICE. In classical architecture, the C. is the uppermost member of the entablature, surmounting the frieze. Each of the orders has its peculiar C.; but these, with their relation to the other portions of the entablature, will be better understood when explained in conjunction with that term. See ENTABLATURE. In the Gothic styles, the form of the C. varies greatly. "In the Norman style," says Parker, "a plain face of parapet, slightly projecting from the wall, is frequently used as a C., and a row of blocks is often placed under it, sometimes plain, sometimes molded or carved into heads and other ornaments, when it is called a corbel table." These blocks have commonly a range of small arches over them. In some cases a small plain string is used as a cornice. The corbel table continued to be used as a C. in the early English style; but it was generally more ornamented than in the Norman, the arches being commonly trefoils and well molded. The blocks are frequently ornamented with a head, or other figure characteristic of the style. Sometimes a range of horizontal moldings is placed above the arches of the corbel table, and sometimes the C. consists of simple moldings, without any corbel table.

The term C. is also used, in a general sense, to signify any horizontal molded projection, terminating a building, or the component parts of a building. It is in this sense that we speak of the C. of a room.

CORNIF'EROUS PERIOD, the second of the five great divisions of the Devonian or old red sandstone age, in American geology. It was the great limestone period of America, and contains the upper Helderberg, the Schoharie, and the Cauda galli epochs.

CORN, INDIAN. See MAIZE.

CORNING, a city and one of the co. seats of Steuben co., N. Y., on the Chemung river, and the Erie, the Fall Brook, and the Delaware, Lackawanna, and Western railroads; 17 miles w. of Elmira. It is in a coal-mining region, and has railroad car works, glass factories, foundries, public library, high school, national bank, and daily and weekly newspapers. Pop, '90, 8550.

CORNING, ERASTUS, 1794–1872; b. Conn.; early settled in Albany, N. Y., as an iron merchant, where he accumulated a large fortune. He was a member of congress from 1857 to 1863, and again in 1865–67. He was for many years one of the great railroad owners and operators of the country, and a promoter of education.

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CORNISH LANGUAGE, a form of speech allied to Welsh and Armorican; not a living language since the beginning of the nineteenth century. It seems to have been in use in Cornwall and w. Devonshire, Eng.

CORN LAWS, the name popularly given to certain statutory enactments which had for their object a restriction of the trade in grain. The English C. L. date as far back as the year 1360, in the reign of Edward III. Before this period, there seems to have been a general rule carried into effect by the crown against the exportation of any grain; and the act of 1360 enacts the prohibition, but at the same time excepts Calais and Gascoigne, with any other places which the king may appoint by license, from its operation. In 1393, the arrangement was reversed, and the right to export was made general, unless to those places to which it was prohibited by royal proclamation. An act of 1436 permitted exportation when the price of wheat did not exceed 6*s*. 8*d*. per quarter. Hitherto, there seem to have been no prohibitions against importation; but in 1463, an act was passed prohibiting it so long as the price at home was below the 6*s*. 8*d*. at which there was free exportation, The next change was in the reign of Henry VIII., when an act of 1534 prohibited all exportation except by license specially granted under the great seal. This act was not found to work well; and 20 years later, the previous arrangement was adopted of allowing exportation when the price had reached a certain point. The subsequent legislation for some time merely changed the price at which exportation might begin, generally enlarging it. After the restoration, the policy of increasing the duties on importation, for the protection of agriculture and the landed interest at home, begins to be perceptible. At the same time, the effect of that event on the condition of Scotland and England towards each other forms a curious illustration of such fiscal regulations. Under the protectorate, they were one country, with free intercommunion of trading privileges. Scotland was increasing in wealth under this arrangement; but the countries were separated by the restoration of Charles II., and became the same to each other as foreign nations. The English duties restricted the importation of grain from Scotland; and in 1663, the Scotch parliament, in retaliation, laid heavy duties on the importation of English and all other foreign grain. Had not the union of 1707 made the countries one again, England and Scotland would probably have continued a corn-law contest against each other, like the French provinces.

The agricultural interest continuing powerfully to modify this department of legislation, an act was passed in 1670, for virtually prohibiting importation, until the home price had reached 53*s*. 4*d*., and laying a heavy duty on it above that point. This law had, however, little effect in favor of the landed interest, from the circumstance, that then, and for long afterwards, Britain was an exporting, not an importing country—that is to say, it generally produced more corn than its population required. A new device was adopted at the revolution, and a bounty was awarded on exportation—that is, a sum was paid to the producer for what he exported, so that if the price in the foreign market might not induce him to send corn abroad, the bounty, in addition to that price, might. For upwards of a century, the numerous enactments in this department will be found to be a mere shifting, according to circumstances, of the incidence of the bounty on the one hand, and of the import duty on the other. In 1773, a permanent adjustment was supposed to be reached by Burke's act, which removed the bounty, and prohibited exportation when the price reached 44*s*., and allowed importation at a nominal duty of 6*d*., at a price of 48*s*. Afterwards, and especially during the great war of the French revolution, it became usual to profess that the chief object of this kind of legislation was to have always a sufficient supply of grain at home for England's wants, and to render her entirely independent of foreign nations for the food of the people. It was maintained that the bounty effected this object, since its tendency was to promote the production of more grain than was necessary at home, and it thus supplied a granary to be drawn upon in case of famine. It was otherwise, however, maintained, that the prohibiting, or, at all events, restraining the introduction of foreign grain, would give a much greater impulse to home production. Looking at it from the agricultural interest solely, this view was well founded; for, as the tendency of Britain to be an importing rather than an exporting country was increasing, the exportation, even with the encouragement of the bounty, was likely to be small. It could not, however, escape consideration, that to increase home production by a pressure on importation, was virtually to aggrandize the landed interest by a pressure on the food of the people. With these views, the price at which importation might begin was raised in 1804, and was again raised in 1814, when the bounty was abandoned as worthless for its purposes. There had been a tendency to what is called "a sliding scale" in the duties on importation. This arrangement was brought into systematic shape by the act of 1814, and subsequently, by the celebrated act of 1828, it reached what was considered by its supporters a state of perfection.

Throughout these various changes there were not wanting writers and speakers who denounced the C. L., and agitated for their removal. But the public at large, though conscious that the laws were some way improper, or at variance with the principles of political economy, did not, till the very last, earnestly unite in calling for repeal. There was a powerful party who defended the C. L., and represented, with wonderful plausibility, that these restrictive statutes were identified with the best interests of the coun-

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try. Their arguments might thus be summed up: 1. Protection was necessary, in order to keep certain poor lands in cultivation. 2. It was desirable to cultivate as much land as possible, in order to improve the country. 3. If improvement by that means were checked, Eng. would be dependent on foreigners for a large portion of the food of the people. 4. Such dependence would be fraught with immense danger; in the event of war, supplies might be stopped, or the ports might be blockaded, the result being famine, disease, and civil war. 5. The advantage gained by protection enabled the landed proprietors and their tenants to encourage manufactures and trade; so much so, that if the C. L. were abolished, half the country shopkeepers would be ruined; that would be followed by the stoppage of many of the mills and factories; large numbers of the working-classes would be thrown idle; disturbances would ensue; capital would be withdrawn; and no one would venture to say what would be the final consequences. It cannot be uninstructive to put on record that these arguments exercised a commanding influence over the laboring classes, the small-town shopkeepers, almost all the members of the learned professions, and a considerable section of both houses of parliament. Ignorance, prejudice, and timidity were united with selfishness in maintaining the C. L.; and in point of fact, those who endeavored to represent the impolicy of a restricted trade in corn, were generally set down as little better than mischief-makers. The most surprising thing of all was, that the statesmen who ultimately joined in condemning the C. L., could contemplate no other modification than an ascending and descending scale of duties, according as prices fell or rose in the market. About 1840, there was no term better known than that of the *sliding-scale*. The object of this device was to reduce the import duty as the price of grain increased, for the purpose of virtually prohibiting the importation when the price was low, and encouraging it when the price was high, so that at famine prices grain might come in duty free. By the act of 1828, the price of 62*s*. a quarter on wheat was taken as the turning-point. At that price the import duty was £1 4*s*. 8*d*. For every shilling less in the price, a shilling was added to the duty. When the price rose above this point, a different gradation ruled, the duty decreasing by a larger ratio than the rise. Thus, when the price was 69*s*., the duty was 15*s*. 8*d*.; and when it rose to 73*s*., the duty sunk to its minimum of 1*s*. The effect of this fluctuation in rendering the trade a gambling one was, one would think, obvious, and yet it was not acknowledged until it had been proved by a series of ruinous instances. Thus, an importer who, when the price of grain was 73*s*. a quarter, bought a cargo, if the price sunk 4*s*. before he could accomplish a sale, had not only to sell at that reduced price, but with a further reduction of 14*s*. 8*d*. a quarter paid as duty. What was still more important, the supplies to Gt. Britain being so capricious and irregular, foreign countries did not grow corn habitually for the British market. In 1843, sir Robert Peel tried a modification of the sliding-scale, which did not in the least degree mitigate the hostility to the C. L., the noxious nature of which was now beginning to be better understood. Roused by the addresses of Mr. Cobden, Mr. Bright, and other leaders of the anti-corn-law league (q.v.), the people poured in petitions to parliament; and at length sir Robert Peel, yielding to representations on the subject, and now avowedly a convert to free-trade (q.v.), carried a measure to put an end to the C. L. in 1846.

The results of the repeal are well known. Every evil prognostication has been falsified. The liberation of the trade in corn has not, however, lowered the price of bread to the extent that some persons anticipated. This is accounted for as follows: an increased demand in consequence of the population increasing in numbers, and also improving in means and taste; the cost of freight and other charges virtually protect the home-grower to the extent of several shillings a quarter; and the diversion of capital from agriculture to manufactures in the United States checks the development of the exports of breadstuffs from that country. The small registration duty of 1*s*. a quarter, maintained till 1869, was abolished in that year; since which time the importation of corn is absolutely free. The substantial benefits arising from the repeal of the C. L. consist in the stimulus given to trade, the removal of apprehensions as to the effects of insufficient harvests, along with a certain modification and less fluctuation in price. The following tables will convey the best illustration of the effects of repeal of the corn laws:

IMPORTS OF FOREIGN WHEAT, CURRENT PRICES OF WHEAT, AND DECLARED VALUE OF ALL BRITISH EXPORTS, FROM 1801 TO 1859.

Average periods of ten years.	Average am't of wheat imported.	Av'r'ge price of wheat during each period.	Average total declared value of all British exports.
	Bushels.	*s.* *d.*	£
1801 to 1810	600,946	81 5	40,737,970
1811 " 1820	458,578	84 11	41,506,794
1821 " 1830	534,992	58 3	36,600,536
1831 " 1840	907,638	56 10	45,249,087
1841 " 1850	2,877,999	53 3	57,412,494
1851 " 1859	4,547,311	54 9	108,253,189

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An alteration in the mode of making the English trade returns prevents a continuation of these tables. In 1858, the total import of wheat, grain, and flour was 23,200,941 cwts.; in 1872, it was 47,612,896. Between the period 1801–10 and 1841–50, we find an increase in the value of British and Irish exports of £16,674,524. Their value in 1871 was £282,380,726, showing an increase over the average of the period 1841–50 of no less than £224,968,282. The value of British and Irish imports in 1890 was £154,335,075; two-thirds came from the United States.

TOTAL AMOUNT OF WHEAT AND FLOUR, AND OTHER GRAIN AND MEAL IMPORTED IN 1844, 1849, 1854, AND 1859, DISTINGUISHING THE COUNTRIES WHENCE RECEIVED.

COUNTRIES.	1844.	1849.	1854.	1859.
	Quarters.	Quarters.	Quarters.	Quarters.
Russia, northern ports	97,143	340,632	168,847	1,020,461
" southern ports	104,292	572,735	539,856	1,384,080
Denmark and the Duchies	656,576	1,311,086	876,269	1,022,255
Prussia	981,374	1,354,691	728,974	1,011,048
Hanse towns	129,808	596,673	420,489	298,494
Other parts of Germany	215,224	416,028	365,190	175,084
Holland	80,316	586,739	250,358	192,808
France	58,265	1,019,410	224,712	2,249,480
Spain	13	26,370	231,508	.....
Italian States	96,727	406,084	117,947	197,041
Wallachia, Moldavia	.....	325,128	147,090	705,290
Turkish Dominions, not otherwise specified	26,389	423,976	303,083	312,934
Egypt	96,047	392,727	588,969	674,257
British North America	258,784	181,622	84,757	82,499
United States	107,812	1,816,425	2,190,223	109,275
Other countries	122,016	899,380	725,277	835,918
Total	3,030,681	10,669,661	7,909,544	10,270,774

CORN MOTH, *Tinea granella*, a small species of moth of the same genus with the clothes' moths (q.v.). This moth is satiny and of a cream-white color; the superior wings marbled with gray, brown, and black, and when at rest sloping like the roof of a house, their fringe turned up behind like a tail. It abounds in spring and summer, and lays its eggs either among stored grain or in sheaves in the field. The eggs are so small as to be invisible to the naked eye. The larva, or CORN WORM—which, for its voraciousness, is known as the *wolf*—eats into the grain, and attaches grains together by a web. It attacks indifferently any kind of grain; sometimes also books, articles of pasteboard, woolen stuffs, and even wood. Frequent turning of heaps of corn is resorted to for the destruction of the eggs and larvæ, and salt is for the same purpose mixed with corn; the floors, walls, ceilings, beams, etc., of granaries are scrubbed with hot water and soap, or washed with lime and water, sprinkled with vinegar, etc., and lamps are employed to attract and kill the moths.—Another very troublesome moth, also called corn moth, is *butalis cerealella*, which is not yet known in Britain, but is found in some parts of Europe and America.

COR'NO, MONTÉ, or GRAN SAS'SO D'ITA'LIA, a mountain in southern Italy, the culminating peak of the Apennines, in lat. 42° 27′ n., long. 13° 38′ east. It has an elevation of 9,591 ft.; and its summit is covered with snow at all seasons.

CORNPLANTER, d. 1836; chief of the Seneca Indians, a half-breed, the son of John O'Bail, an Indian trader. He was present at Braddock's defeat, and was one of those who, during the revolution, devastated Wyoming valley. After peace, he became friendly with the Americans, and was, with Red Jacket, a leader and counselor of his people. He was strongly opposed to the use of liquor, and was one of the most eloquent temperance orators of the country. He lived to be 100 years old.

CORN RENT. See RENT, LEASE.

CORNS are small hard growths, resulting from an increase in the thickness of the cuticle or epidermis, which is generally caused by the irritation of some excessive pressure or friction on the part. They occur most commonly on the toes as a result of tight shoes. Three varieties of C. are described, viz.—1. *Laminated corns* or *callosities*, in which the hardened cuticle is arranged in layers, frequently of a dark-brown color, from the effusion of blood in the deeper layers. 2. *Fibrous corns* (clavi), which are not only fibrous in their early stages, but, as time goes on, sink into the skin, sometimes producing great pain. Frequently, a bursa, or small bag, is formed beneath, to protect the tender subjacent tissues, and if this bursa should inflame, matter speedily forms, and the pain and constitutional irritation becomes severe; at other times, the pressure may cause absorption of the ends of bones, and serious alterations in the condition of a joint. The duty of the chiropodist is to dislodge the imbedded peg of hard cuticle from its socket. Should he cut it across, the fibrous arrangement will present the appearance of "roots," a popular delusion of great value to itinerant corn-doctors. 3. *Soft corns* occur between the toes, and cause much annoyance; they are generally small, and being constantly bathed in perspiration, the cuticle does not harden, as in the other varieties. They sometimes give rise to painful ulcerations.

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The treatment of C. consists in the removal of all undue pressure or friction, either by removing the shoe altogether, or protecting the corn by surrounding it with a border of some soft material, as amadou (q.v.) or soft leather: or the hardened cuticle may be softened by the application of some alkaline lotion, and then scraped or filed away: or it may be extracted, as before mentioned. A lotion of soda or potash is often found very useful. The cuticle composing a soft corn should be clipped off with scissors, and a small piece of cotton-wool be placed between the toes. In all serious cases, application should be made to a respectable chiropodist.

C. affect horses as well as men. In the foot of the horse they occur in the angle between the bars and outer crust, and consist in a bruise of the sensitive secreting sole. Two forms of feet are especially subject to them—those with deep narrow slanting heels, in which the sensitive sole becomes squeezed between the doubled-up crust and the shoe; and wide flat feet which, by the senseless cutting away of the bars and outer crust, allow the delicate interior parts to be pressed with all the force of the animal's weight on the unyielding iron shoe Serum and blood are poured out, whilst the secreting parts being weak and irritable, produce a soft, scaly, unhealthy horn. C. constitute unsoundness; cause a short, careful, tripping gait; are the most frequent source of lameness amongst roadsters; abound in badly-shod horses, especially those with the kind of feet alluded to; and usually occur in the inside heels of the fore feet, these being more especially subjected to weight, and hence to pressure. The discolored spot indicating the recent corn must be carefully cut into with a fine drawing-knife; any serum or blood is thus allowed free vent. If the bruise has been extensive, a poultice will have the twofold effect of allaying irritation, and relieving the sensitive parts by softening the hard unyielding horn. When the injury has been of some standing, and soft faulty horn is secreted, a drop of diluted nitric acid may be applied. On no account must the bars or outer crust be removed; they are required for bearing weight, which may be further kept off the injured part by the use of a bar-shoe. In horses subject to C., keep the feet soft by dressing with tar and oil, or any suitable emollient; pare out the C. every fortnight; use a shoe with a wide web on the inside quarter, and nailed only on the outside; and, if the sole is thin and weak, employ leather pads.

CORN SALAD, or LAMB'S LETTUCE, *Fedia* or *Valerianella*, a genus of plants belonging to the natural order *valerianaceæ*, having a toothed calyx and 5-fid corolla, three stamens, and a 3-locular fruit, crowned with the calyx. The species are annual plants of humble growth, with repeatedly forked stems, and very small flowers, growing in cultivated grounds, etc. Several species, very closely resembling each other, are natives of Britain, and others are found on the continent of Europe. Some of them are frequently used as spring salads, and sometimes as a substitute for spinach, particularly the common C. S. (*F.* or *V. olitoria*), the most abundant species in Britain, the *mâche* of the French, *rapunzcher* of the Germans. It is a favorite salad in France and Germany, although it is mucilaginous, and wants pungency. The lower leaves are somewhat spoon-shaped, the upper leaves oblong. The plant is extremely easy of cultivation, and can be obtained in the very first days of spring, when vegetables are scarce. The VINEYARD SALAD of the Germans (*F.* or *V. carinata*), and ITALIAN C. S. (*F.* or *V. eriocarpa*), are sometimes preferred for their larger leaves or finer flavor.

CORN SAW'FLY, *Cephus pygmaeus*, a species of sawfly (q.v.) which sometimes does much mischief in cornfields, particularly to wheat and rye; the female, by means of her ovipositor, laying her eggs in the stems either below the first joint or just under the ear; the larva consuming the inside of the stalk, sometimes perforating the joints, and at last cutting it through near the ground, and undergoing its transformation into the pupa state in the stump which remains. The C. S. is almost half an inch long, of a very slender form, shining black with some yellow markings; the larva is fat, tapering, wrinkled, and yellow. The fly is often to be seen on the flowers of umbelliferous plants.

CORN SNAKE, a non-venomous serpent common in the southern U. S. of brown color, and sometimes 5 ft. long. It is quite tame, and lives upon mice and other small animals.

CORNSTONE, a peculiar—often mottled—limestone of the old red sandstone formation of Herefordshire, Shropshire, and South Wales.

CORN THRIPS, *Thrips cerealium*, a minute insect, not quite a line long, often abundant on flowers, and which does much mischief to grain crops, particularly late-sown wheat, insinuating itself between the chaff and the immature grain, which it causes to shrivel; also at an earlier period causing the abortion of the ear, by puncturing the stalks above the joints and sucking the juice. The C. T. is of a shining pitchy black, the body long, the male wingless, the female having four narrow wings, which are fringed with long hairs; the larva is yellow, as is also the pupa, which is active. See THRIPS.

COR'NU AMMO'NIS. See AMMONITES.

CORNUCO'PIA (Lat. *cornu*, a horn, and *copia*, plenty). The horn of plenty—regarding the origin of which several fables are told by the ancient poets—is generally placed in the hands of emblematical figures of plenty, liberality, etc., who are represented as

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pouring from it an abundance of fruits, corn, etc. It is frequently used both in architecture and heraldry. On the arms of banks, and other public institutions, it is often represented pouring forth coins.

CORNUTUS, L. ANNÆUS, a Stoic philosopher of the time of Nero, a native of Lybia, but a resident of Rome. He was the teacher and friend of Persius, who left to him all his books and a large sum of money. He took the books, but gave the money to the sisters of the donor. Although a friend of Nero, the tyrant banished Cornutus because he did not like his advice as to the number of books in which he (Nero) proposed to write the history of the Romans. Cornutus was a voluminous writer, but little is known concerning his works.

CORN'WALL, a maritime co., forming the s.w. extremity of England, and the southmost co. in the British isles. It is a peninsular right-angled strip of land, with the apex in the s.w., and is bounded on the e. by Devonshire, with the Tamar between, on the n. and w. by the Atlantic, and on the s. by the English channel. From its Devonshire boundary it runs s.w., narrowing to the Land's End, the westmost part of England, in 5° 41′ 31″ w., it then bends n. to Penzance, whence it sweeps round in a south-eastern direction to the Lizard point, the southmost part of England, in 49° 57′ 30″ south, From thence it follows a north-eastern course to Plymouth sound. Greatest length in a straight line from Welcomb to the Land's End, 81 m.; extreme breadth from Welcomb to Rame Head, 46 miles. Area, 1371 sq. m., most of which is arable, meadow, or pasture. The surface is irregular, with rapid ascents and descents. A ridge of rugged, bleak, moory hills, rising to the height of from 800 to 1300 ft., runs s.w. through the centre of Cornwall. From this ridge the country slopes, and the streams flow on each side. The hill valleys are longer and wider on the s. than on the n. side of this ridge, and some of them are picturesque with corn, wood, orchards, rivulets and meadows. The coasts are bold and rocky, and indented with many headlands and bays. The chief indentations are Plymouth harbor, Falmouth harbor, one of the finest in Britain, and Mount's bay between Lizard point and Land's End. Twenty-four m. off the latter point are the Scilly isles. On the n.w. coast occur shifting sands, often in hills several hundred ft. high. The chief rivers are the Tamar, which runs 59 m. along the e. border, 19 m. being a tidal estuary, ending in the noble roadstead of Plymouth sound; the Fal, which runs 20 m. s., 10 m. being tidal, and ends in the fine harbor of Carrick road, near Falmouth; and the Allan or Camel, 29 m. long, 8 being navigable. Woods, meadows, arable land, and 140 parish churches, are said to have been submerged between Mount's bay and the Scilly isles. Old red sandstone, the "killas" of the miner, covers above three-fourths of C., and is intersected by three large masses of granite in the interior of the county, with one around Land's End, and by porphyry veins and dikes, some being 50 or 80 fathoms thick, and also by limestone beds. The granite on the hills is often worn by the weather into the form of prismatic, cubical, or spheroidal blocks, piled in gigantic cairns. These blocks sometimes form logging or logan stones. Mining is the chief industry and tin the most important mineral of the county. Copper and tin veins, generally 1 to 3 ft. thick, but varying from the thickness of paper to 30 ft., and of unknown depth, run through the granite and sandstone, generally from e. to west. Tin also occurs in the gravel; and lead, silver, cobalt, and antimony veins in the sandstone. Lizard point consists of mica-slate, with soapstone veins and chinastone; and the country around, of serpentine, hornblende, and diallage rocks. Chinastone, or decomposed feldspar of granite, is found near Launceston, and is a chief ingredient in retorts and crucibles made in Staffordshire. The great mining district extends from Dartmoor, in Devon, to Land's End, the veins and lodes chiefly occurring in granite, or killas.

The climate is mild, especially in winter, but damp, with almost daily rain. Snow rarely lies above a few days. South-west winds prevail for nine months in the year, and furious gales are frequent. Some plants of the s. of Europe, as the myrtle, tamarisk, and balm of Gilead, flourish in the open air; but fruits do not ripen well. The soil is light, gravelly, or slaty. The land is generally barren in the mining tracts, but fruitful in the valleys and on the coast. The chief crops are barley, wheat, oats, and potatoes; but harvest is generally later than in the inland counties. Near Penzance, however, two crops of potatoes are got yearly. C. is far more a mining than an agricultural county. The pilchard fishery is very profitable, and employs a large number of people from July to Sept. The chief exports are mining produce and fish. Landed property is much divided. The total area of C. is 868,208 acres, or about 1357 sq. m. The census of 1891 gave a pop. of 322,571. For electoral purposes, C. is divided into six parliamentary divisions and one parliamentary borough comprising Falmouth and Penryn. C. has ancient British antiquities, such as rude, upright stone blocks, single and in lines, circles, barrows, and cromlechs. Many Roman coins, etc., have been found. There are many Saxon camps and earthworks. C. and the Scilly isles are supposed to have been the Cassiterides, or tin isles of the Phenicians and Greeks, but there is no positive evidence to show that the Phenician or Carthaginian merchants ever really visited the country, although it is certain that, before the Roman occupancy, tin was exported to a considerable extent from C. The country formed a part of the British dominions after the Saxon invasions had confined the natives to the west, and it held

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out against the Saxon power for many years. Wessex, however, gradually extended its borders westward, and finally Athelstan, about 926, made the Tamar the boundary between Britons and Saxons. Later the Cornish bishop submitted to the archbishop of Canterbury. By the time of William the Conqueror, as appears from the Domesday book, the land had mostly passed under Saxon ownership. William gave nearly the whole country to Robert of Mortain, thus laying the foundation of the earldom of C., which was always bestowed upon men akin to the royal house. The best known of the earls of C. was Richard, brother of Henry III., who received the title "King of the Romans," and tried in vain to make good his claim to the German throne. Even at this early date the great wealth of the country was largely derived from its tin mines, which are said to have supplied the markets of Europe. In the 14th century the earldom was raised to a duchy by Edward III., who bestowed it upon his son, the Black Prince, and since that time it has remained an appanage of the crown, the prince of Wales being the duke of Cornwall. The prince of Wales derives a large revenue from it, and appoints the sheriff. The mining trade is under the jurisdiction of the so-called Stannary Courts, under a lord warden and a vice-warden. Ancient charters had exempted the tinners of C. from all other jurisdiction than that of these courts. The meeting of the 24 stannators was called a parliament, and was held at Truro until 1752, but for many years after that date there was little, if any, business transacted in these courts. In 1836, however, the necessity for special jurisdiction over mining matters having been made evident, parliament remodelled the stannaries and enlarged their jurisdiction. Subsequent statutes have further amended the stannary laws. The old Cornish tongue belongs to the Cymric division of the Celtic language, and is nearest akin to the Welsh and Armorican. It was spoken until toward the end of the 18th century, and survives in a few words occasionally used in the fishing and mining towns. The chief relics of the language are in a series of religious dramas or miracle plays, which were edited and translated by Edwin Norris (Oxford, 1859). There is also a poem on the passion of Christ. A dictionary of the language was prepared by Williams (1865), under the title of *Lexicon Cornu-Britannicum*. The *Grammatica Celtica*, revised by Ebel in 1871, contains a treatise on Cornish grammar.

CORNWALL, a town in Litchfield co., Conn., 37 m. w. of Hartford, on the New York, New Haven, and Hartford railroad; pop. '90, 1283. In 1818 a mission school was established in Cornwall for the purpose of qualifying converts from paganism to preach the gospel to their countrymen. The town was incorporated in 1740, and is principally engaged in agriculture and the manufacture of shears.

CORNWALL, a town in Orange co., N. Y., on the Hudson river, a little n. of the highlands, and embracing the village of Cornwall-on-Hudson. Pop. '90, town, 3766, village, 360. It is a picturesque region, and is much frequented in summer by tourists and sojourners from the cities; reached by the West Shore, and N. Y., Ont., and West. railroads.

CORNWALL, a port of entry and principal town of the united counties of Stormont, Dundas, and Glengarry, Ontario, Canada; on the St. Lawrence river, the Cornwall canal, and the Grand Trunk railroad; 67 miles s.w. of Montreal. Pop. '91, 6805. There is excellent water-power, and manufacturing is the chief industry.

CORNWALL, BARRY. See PROCTER, BRYAN WALLER.

CORNWALLIS, CAROLINE FRANCES, was b. on the 12th July, 1786, and was the younger daughter of the Rev. William Cornwallis, rector of Wittersham and Elam in Kent. As a child she was precocious; but she escaped the usual fate of precocious children. She lived to a good old age; she was even more remarkable as a woman than as a child; and her mind was growing, if not in vigor, in boldness and freeness, even to the last.

She acquired a thorough knowledge of Latin and Greek, and a considerable knowledge of Hebrew; and made herself conversant with nearly every study which occupies the more thoughtful of men—with philosophy, theology, history, natural science, social science, politics, and even law. In her latter days, her knowledge of most of these subjects was only surpassed by that of men who had taken them for their specialty. To her letters we are indebted for what little has been made known to us of her life, Miss C. having desired that her life should not be written, and having carefully destroyed the papers which might have supplied the materials of a memoir. As regards religion—the great interest of her life—we learn from these letters how, under the influence of enlarged knowledge and reflection, she gradually drifted away from the narrow orthodoxy in which she had been brought up, and adopted views which some would call more enlarged and rational, others latitudinarian. It is to the study of the Greek fathers, and to the influence of a long residence in Italy, which began in 1826, that she ascribed the complete change which took place in her religious opinions. It is right to say, that while she was bold and fearless in accepting beliefs far removed from those of her age and country, her faith in Christianity became stronger instead of weaker, and that she was always careful not to wound the honest opinions or prejudices of others. Among the most esteemed of her correspondents was Sismondi, who is said to have made her

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an offer of marriage when she was about 20 years old. The offer was declined, but without causing any abatement of friendship or admiration on either side.

Her first work, *Philosophical Theories and Philosophical Experience, by a Pariah*, appeared in 1842. It was the first of a series entitled *Small Books on Great Subjects*, which she had formed the idea of writing with the help of a few friends. Of the 20 volumes of this series which appeared between 1842 and 1854, nearly all—all the most important—were written by Miss Cornwallis. The subjects discussed were very various—the connection of physiology and intellectual science, ragged schools, grammar, criminal law, chemistry and geology, Greek philosophy, and the history and influence of Christian opinions. The works in which the last-mentioned subject was treated—*The State of Man before the Coming of Christ* (1 vol.), and *The State of Man after the Coming of Christ* (3 vols.)—were the most important of the series. She had designed to add to them one more volume—a survey of the present condition of England, social, political, and religious; but this was never completed. The series attracted much attention in this country, and still more in America; and the books in which Christianity and its influence were considered were so judiciously written, that, though presenting a system of thought and belief entirely different from our orthodox Christian teaching, they were favorably received by many of every religious party. These are still the best short and popular account we have of subjects of great interest and importance, of which the majority of the clergy even were profoundly ignorant 20 years ago. In illustration of the ignorance which prevailed amongst Anglican clergy at a time still recent, Miss C. used to say that she once met a clergyman who had never heard of the fathers; and that among a multitude to whom she applied for information about their writings, not one knew anything about them. Besides the *Small Books on Great Subjects*, Miss C. published, in 1847, *Pericles, a Tale of Athens*, which good judges have declared to be an admirable picture of Athenian life; and in 1853, she published a prize essay on juvenile delinquency.

From an early period of her life, her health had been infirm; in her later years, it was very precarious, and she was for the most part confined to bed. She lived latterly at Ildwells, near Tunbridge Wells. She died there on Jan. 8, 1858. A voluminous author, her name was at her death unknown to the world, and it remained unknown until the publication of her *Letters and Remains*, in 1864. She had two reasons for making a secret of her authorship. First, there was a strong prejudice against female authorship in her young days, and even when she began to write; and she feared not the ridicule or scorn, but the neglect which might await her books were it known that they were written by a woman. She wrote in the hope of doing some good, and she concealed her name, that her purpose might not be frustrated. Secondly, she wished to show the world what the female intellect was capable of, and the concealment of her name made her secure of impartial criticism. She believed firmly that the intellects of women were not inferior to the intellects of men, and that their apparent inferiority was entirely the result of inferior training. She regarded the praises bestowed upon her books, the acknowledgment of the originality, accuracy, and vigor, as a tribute not to herself but to her sex. If the books do not prove the intellectual equality of the sexes, they certainly prove that Miss C. was a very exceptional woman. We know from her letters and from the testimony of her friends, that her masculine brain and a great stock of erudition did not prevent her from affording a beautiful example of the graces and charms of the feminine character.

CORNWAL'LIS, CHARLES, Marquis, an English gen. and statesman, son of the first earl Cornwallis, was b. Dec. 31, 1738, and was educated at Eton and Cambridge. He served as aide-de-camp to the marquis of Granby in the seven years' war; in 1776, was made a col., and four years later, governor of the tower of London. Though personally opposed to the war in America, he accompanied his regiment thither, and with an inferior force gained victories over Gen. Gates at Camden in Aug., 1780, and over Gen. Greene at Guilford, Mar., 1781 In the same year, however, he was forced to surrender with all his troops at Yorktown, Va. This disaster proved the ruin of the British cause in America, and was the occasion of much dissatisfaction, resulting in a change of ministers at home. C., however, who was high in favor with the king, escaped censure. In 1786, C. was appointed governor-general of India and commander-in-chief, and in this double capacity distinguished himself by his victories over Tippoo Saib, and by his unwearying efforts to promote the welfare of the natives. His measures, however, were far from answering the purposes he intended. He returned from India in 1793, when he was raised to the rank of marquis. Appointed lord-lieutenant of Ireland in 1798 during the time of the rebellion, he succeeded in putting it down, and in establishing order in a manner that gained him the good-will of the Irish people. As plenipotentiary to France, he negotiated the peace of Amiens. Reappointed governor-general of India in 1804, he died at Ghazipore, in the province of Benares, in Oct., 1805, on his way to assume the command of the army in the upper provinces. As a statesman or warrior, C.'s talents did not rise much above respectable mediocrity, but he was upright, diligent, and humane in a more than ordinary degree.

CORN WEE'VIL, *Calandra granaria*, a coleopterous insect of the family *curculionidæ*, which, although a small creature, not quite two lines long, is often extremely destructive

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to grain stored in granaries. It is much more common in the southern than in the northern parts of Europe. The perfect insect is of a dark chestnut or reddish pitchy color, with short oval wing-cases, but without wings, the thorax much marked with depressed dots, the head elongated into a proboscis, the antennæ bent at right angles. The female makes a little hole in a grain of corn, and deposits an egg in it, the larva feeds on the farina; and as a single female lays many eggs, and perfect insects are soon produced from them, the mischief, unless counteracted, extends very rapidly To arrest it, however, has always been found extremely difficult; and the most successful method is said to be that of making a little separate heap of grain, which being left unstirred, whilst the greater heap is stirred very frequently, soon becomes the refuge of the weevils, particularly if it is a heap of barley, of which they are fondest, although they will eat any grain, and there they are killed by boiling water.—Of the same genus are the rice weevil (*calandra oryzæ*), and a large South American insect (*C. palmarum*), an inch and a half long, the grub of which lives in the stems of palms, and is eaten as a delicacy both by Indians and Creoles. See illus., BUTTERFLIES, ETC., vol. III.

CORO (now named FALCON), a state in Venezuela on the Caribbean sea and the gulf of Venezuela, the extreme n. part of the republic. It is drained by many small rivers emptying into the Caribbean sea, one of which, the Tocoyo, is navigable. The soil is sandy and dry, and a large portion is still covered with forests. The principal productions are coffee, corn, cacao, and tropical fruits. Area of Falcon (with Zulia), 36,212 sq. m.; pop. '91, 224,566.

CORO, or SANTA AÑA DE CORO, a maritime t. in Venezuela, capital of the province of Falcon, on the peninsula dividing the gulf of Venezuela from the Caribbean sea, 155 m. w.n.w. of Valencia; pop. 9,000. The climate is hot and unhealthy. The water supply is brought by mules from springs some miles away. There is some trade with the West Indies. This is one of the oldest of the Spanish settlements, having been formed in July, 1527. It was the capital of Venezuela until 1576. The town suffered greatly in the Venezuelan war of independence.

COROL'LA, in botany, the inner floral envelope of the greater number of phanerogamous plants; the second of those whorls of modified leaves which form the flower (q.v.). It is in the C. that fine colors and the greatest delicacy and beauty of the flower are in general chiefly displayed. The modified leaves of which it is composed are called *petals*, and are very various in form and number. They are also in very many plants united into a tube at the base, when the C. is said to be *monopetalous;* and this union often extends through their whole length, leaving their number to be discerned merely in the teeth in which the C. (bell-shaped, funnel-shaped, tubular, etc.) terminates. The petals of a flower are either similar, when the C. is said to be *regular*, or they differ in form, often very widely, when it is called *irregular*. They not unfrequently assume remarkable and even grotesque forms. Many petals have appendages of various kinds, as *scales, nectaries, spurs, coronæ* or *crowns*, etc. Petals often consist of a *limb*, or expanded portion, and a *claw*, the narrower part, which is covered by the calyx, and by which the petal is attached, but sometimes the claw is wanting or obsolete, sometimes it is united with the tube of the calyx, so that the petals appear to rise out of the calyx. See CALYX and PERIANTH.

COR'OLLARY, a proposition the truth of which appears so clearly from the proof of another proposition as not to require separate demonstration.

COROMAN'DEL COAST, often vaguely taken as the whole of the w. shore of the bay of Bengal, extends, in its proper acceptation, from point Calimere, in lat. 10° 17′ n., long. 79° 56′ e., to Gondegam, in lat. 15° 20′ n., long. 80° 10′ east. It is pretty nearly co-extensive with the districts of Tanjore, Arcot, Chingleput, and Nellore, comprising, along with Madras and Pondicherry, the grand battle-field of last century between England and France in India. With various estuaries and inlets, it is yet commercially of very little value, not presenting a single safe place of refuge for large vessels. So shallow, moreover, is the water for a considerable distance from the land, that ships of any size are obliged to lie several miles off; while the intermediate space, or at least that belt of it that is nearest the beach, presents a surf in which no ordinary boat can live—the only safe craft being the native catamaran (q.v.).

CORO'NA, in astronomy, the name given to the phenomenon seen around the sun during a total eclipse. This phenomenon is a complex one, and comprises effects due to the sun's surroundings or the various layers of its atmosphere, to the light falling on something between the observer and the sun, and to certain physiological effects in the eye. The solar part of the phenomenon comprises the "chromosphere," a layer of brightly incandescent hydrogen, with other included metallic vapors, which lie immediately over that interior part of the sun which we ordinarily see; the "prominences," or "red flames," which are the local uprisings of the chromosphere; and outside of all, the "coronal atmosphere," which consists, as far as known, of hydrogen less brightly incandescent than that in the chromosphere, and of an unknown substance, the vapor density of which appears to be less than that of hydrogen.

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CORONÆ, in meteorology, colored rings seen around the sun or moon through peculiar forms of cloud. See HALOS.

CORONA (Lat. a crown), in architecture, the drip, or lower member of the projecting part of a classical cornice. See ENTABLATURE. The term C. is also applied to the apse or semicircular termination of the choir, especially by ecclesiastical writers. Hence we hear of "Becket's crown," at Canterbury. C. is also applied in ecclesiastical nomenclature, to a chandelier, in the form of a crown or circlet, suspended from the roof of a church, or from the vaulting of the nave or chapels, to hold tapers which are lighted on solemn occasions.

CORO'NA, or CROWN, in botany, an appendage of the corolla in some flowers; sometimes assuming the appearance of an interior corolla very different from the true corolla, and either divided into parts resembling petals, or consisting only of one piece, and surrounding the organs of fructification like a monopetallous corolla; sometimes assuming very peculiar forms. It is often difficult to determine whether the C. is properly to be regarded as belonging to the row of petals, or to that of stamens. The C. was included by Linnæus under the very comprehensive term nectary. A familiar example may be seen in *narcissus;* forms very different may be seen in *stapelia*, and other genera of the natural order *asclepiadaceæ.*

CORONA BORËA'LIS, a small and bright constellation near Hercules.

COR'ONACH, a dirge, or wailing for the dead, long common among the Gaels of Scotland and Ireland in early times. The practice seems to have been in vogue in Greece and Rome, and is still, to some extent, in use at Irish wakes. See CORANACH.

CORONA'TION. The use of crowns in antiquity, as a mark either of honor or of rejoicing will be explained under CROWN. It was, no doubt, as an adaptation of this general custom to a special use that the practice of placing a crown on the head of a monarch at the commencement of his reign was introduced. The practice is very ancient, as we may learn from the fact that Solomon and Ahaziah were crowned; and there is probably scarcely any country in which it has not been followed in one form or another. Generally it has been accompanied by what was regarded as the still more solemn rite of anointing with oil, a ceremony which, from the time of the ancient Hebrews to our own, has been peculiarly significant of consecration or devotion to the service of God. The term employed for C. in the Saxon chronicle, "gehalgod," is hallowed or consecrated; and it would seem that the ceremony as then performed at Kingston-on-Thames or Winchester, was in all essentials the same as that which now takes place in Westminster abbey. A copy of the Gospels is still in existence amongst the Cottonian MSS. in the British museum, which is believed to be the identical copy on which the Saxon kings were sworn. Detailed accounts of many English coronations, from Richard I. downwards, have been preserved. They will be found enumerated, along with those of the German emperors, the kings of France, emperors of Russia, etc., in Bohn's *Cyclopædia of Political Knowledge;* and much more fully, along with much interesting information on the subject generally, in *Chapters on Coronations* (Lond. 1838).

CORONATION GULF, an inlet of the Arctic ocean, forms the s.e. part of the land locked and isle-studded bay that receives the Coppermine. Lat. 66° 30′ to 68° 30′ n., long. 107° 20′ to 116° west.

CORONATION OATH. The form in which the limitations on the English monarch were defined by the nation and accepted by him, was probably from the first something equivalent to a coronation oath. Up to the period of the revolution of 1688, however, the C. O., like all the other guarantees for popular liberty, admitted of being tampered with; and there is in existence (Cottonian MS., Tib. E. viii.) a copy of the oath sworn by Henry VIII., interlined and altered with his own hand.

To obviate the possibility of such proceedings for the future, the existing C.O., altered only in consequence of the subsequent unions between England and Scotland, and Great Britain and Ireland, was fixed by stat. 1 Will. and Mary, st. 1, c. 6. It is to the following effect, and thus administered. The archbishop of Canterbury demands of the king (or queen): "Sir (or madam), is your majesty willing to take the oath?" and on the king answering, "I am willing," the archbishop propounds these questions: and the king, having a copy of the printed form and order of the coronation service in his hands, answers each question severally, as follows:

Archb. Will you solemnly promise and swear to govern the people of this United Kingdom of Great Britain and Ireland, and the dominions thereto belonging, according to the statutes in parliament agreed on, and the respective laws and customs of the same?

King. I solemnly promise so to do.

Archb. Will you, to your power, cause law and justice, in mercy, to be executed in all your judgments?

King. I will.

Archb. Will you, to the utmost of your power, maintain the laws of God, the true profession of the Gospel, and the Protestant reformed religion, established by law? And will you maintain and preserve inviolably the settlement of the united church of England and Ireland, and the doctrine, worship, discipline, and government thereof, as by

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law established within England and Ireland, and the territories thereunto belonging? And will you preserve to the bishops and clergy of England and Ireland, and to the churches there committed to their charge, all such rights and privileges as do, or shall appertain unto them, or any of them?

King. All this I promise to do.

The sovereign then goes to the altar, and laying his hand upon the Gospels, takes the following oath: "The things which I have heretofore promised, I will perform and keep, so help me God."

The sovereign then kisses the book, and signs the oath.

The passage in the oath in which the sovereign guarantees the privileges of the church of England, is framed in conformity with the "act for securing the church of England as by law established," which is declared to be a fundamental and essential part of the treaty of union, and which was inserted accordingly in the act by which the treaty of union was finally ratified. The passage in the act which provides for the security of the church of Scotland was framed in conformity with an "overture for an act for security of the church"—of which a copy will be found in the appendix to Defoe's *History of the Union*, p. 617. It is to the effect that, "after the decease of her present majesty (whom God long preserve), the sovereign succeeding to her in the royal government of this kingdom shall, in all time coming (not at the coronation) *at his or her accession to the crown, swear and subscribe* that they shall maintain and preserve the aforesaid settlement of the true Protestant religion, with the government, worship and discipline of this church, as above (that is, by the previously recited act, 1 Will. and Mary, c. 5) established inviolably." The security of the church of Scotland is thus provided for, by what may be called an accession oath, even during the period which must intervene between the accession of the sovereign and his coronation, when he is not bound, by oath at least, to the maintenance of the other branches of the constitution. The oath has not yet been altered to suit the disestablishment of the Irish Church.

CORONEL'LA, a genus of non-venomous serpents of the family *colubridæ*, of a small size, having a somewhat compressed and generally pentagonal body, and rather long conical tail. They inhabit the warm and temperate parts of the world. One species, *C. lævis*, is found in the center and s. of Europe.

CORONER (Lat. *coronator*, *corona*, a crown), a very ancient officer in England, at the common law. He is mentioned in a charter of king Athelstan, 905 A.D; and the office, like much of the common law, is acknowledged to be of Saxon origin. The name is derived from the fact, that the C. has chiefly to do with pleas of the crown. In this light, the lord chief-justice of the queen's bench is the principal C. in the kingdom, and may exercise jurisdiction in that capacity in any part of England. There are, however, particular coroners for every place in England, and in some counties, three or four, or even more. They were formerly paid by fees on each inquest, but now (23 and 24 Vict. c. 116) by salary paid out of the county rate. The C. is chosen for life, and the election rests with the freeholders of the county or district. A C. may, however, be dismissed by the lord chancellor for inability or misbehavior in his office. By the statute of Westminster the first (3 Edw. I. c. 10), it was enacted that none should be chosen but lawful and discreet knights; and in the time of Edward III., there is an instance of a man being removed from the office because he was merely a merchant. Subsequently, it was thought sufficient if a man had lands enough to entitle him to be made a knight; and Blackstone complains that in his time it had come to be sought for the perquisites, and not for the honor of serving the country. This motive has now ceased. The C. is now usually a professional man, frequently an attorney or a medical man.

The office of C. is to some extent the only one in England charged with the investigation of crime. Where the C. cannot act, there is no authority to examine witnesses until a suspected person has been actually charged or accused before a magistrate. But even the C.'s duties are very limited, and little is added to the statute 3 Edw. I. The C. can inquire only into the causes of violent or sudden death, and into these only when the body has been found. When such a death happens, it is the duty of the constable to give notice of it to the C., who then summons a jury from the body of the county for the purpose of making an inquisition into the matter. The C. presides over the inquisition, and the court thus constituted is a court of record. The jury consists of twelve men at least, who are sworn and charged by the C.; and the verdict must be of twelve. By 6 and 7 Vict. c. 12, it has been enacted that the inquest shall be held before the C. in whose district the body shall be "lying dead." If any be found guilty by such inquisition of murder or other homicide, the C. is to commit them to prison for further trial, and is also to make inquiry concerning their lands, goods, and chattels (which are forfeited thereby), if not otherwise known; and he must, moreover, certify the whole of this inquisition under his own seal and the seals of the jurors, together with the evidence thereon, to the court of queen's bench or the next assizes. The accused may thereupon be put on his trial without other indictment. By 6 and 7 Will. IV. c. 89, the C. is empowered to summon, and by 1 Vict. c. 68, to pay, medical witnesses, in place of referring them for payment to the church-wardens. The sums allowed are one guinea for a simple examination, and two guineas if a *post-mortem* examination of the body has been made. By 6 and 7 Vict. c. 83, coroners are empowered to appoint deputies in case of absence from illness or other reasonable cause. 9 and 10 Vict. c. 37, regulates the duties

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of the C. and the expenses of inquests in Ireland. Another branch of the C.'s office is to inquire concerning shipwrecks and treasure-trove; but this has been nearly superseded by the provisions of the merchant shipping act, 1854. He is a conservator of the king's peace, in which capacity he is mentioned in one of the oldest treatises on the common law (*Mirror*, c. 1, s. 3). As such, he may cause felons to be apprehended, whether an inquisition has found them guilty or not. The C. has likewise ministerial functions as the sheriff's substitute, in executing process in suits in which the sheriff is related either to the plaintiff or defendant. Latterly, the office of C. has been the subject of consideration, with a view to certain reforms of administration. In many cases, it is alleged that the C. makes a job of his office, trumps up cases, and acts vexatiously at variance with the warrants of magistrates. Coroners or crowners, as they were also called in England, are mentioned in many old Scottish statutes; and there is no doubt that the office, as well as that of alderman and mayor, existed in those parts of the country that were peopled by persons of Teutonic race. But it was abolished or fell into desuetude, probably in consequence of the secession war and the French connection; and in Scotland the duties are now chiefly performed by an officer appointed by the crown, styled the procurator-fiscal.

In the United States a C. is appointed, usually one or more in each county or city. The functions of a coroner are almost exclusively confined to holding inquests upon persons who have died by violence or accident, or in a sudden or mysterious manner. He summons a jury, and if need be, a physician, and inquires into the facts, after which a verdict is returned. Neither the coroner nor the jury have any defined responsibility; they can only recommend, except in cases of crime, where the coroner has power to cause arrests and to commit to prison.

CORONET. See CROWN.

COROT, JEAN BAPTISTE, CAMILLE, French landscape painter, was born at Paris, July 29, 1796; was sent to school at Rouen, and then, although exhibiting artistic talent, was apprenticed to a draper in Paris. In 1822–23 he studied art under Michallon and Victor Bertin, but cared little for their conventional methods, and in 1826 went to Italy, where he remained several years studying and painting. In 1826 he exhibited in the Paris Salon a "View of Narni," and "The Roman Campagna." In 1833 he obtained a second-class medal; in 1848 and 1855 first-class medals; in 1846 received the Cross of the Legion of Honor, and in 1867 was promoted officer. In 1874 he was presented with a gold medal by many of the French artists, as a token of their admiration and affection. He died at Paris, Feb. 22, 1875. Corot's dreamy and original pictures were not appreciated outside of artistic circles for many years, but his influence on French art was marked and permanent, and he is regarded as the founder of the "naturalistic school," to which Millet, Rousseau, Diaz, and others belonged. Among his works are, "View in Italy" (1834); "Dance of Nymphs" (1850); "Evening" (1857); "Idyl" (1859); "Dante and Virgil" and "Solitude" (1866); "Morning at Ville d'Avray" (1868); "Le Bucheron" (exhibited in 1875).

CORPORAL, the lowest non-commissioned officer of a company of infantry, cavalry, or artillery, next above a private, and below a sergeant. There are 4 allowed to a company of infantry, a troop of cavalry, and a battery of artillery. He has charge of a squad, places and relieves sentinels, and has a certain disciplinary control in camp and barracks.

CORPORAL (Lat., *corpus*, a body, because of the belief that the bread and wine are the body and blood of our Saviour), a name given to the cloth with which the minister covers what is left of the consecrated elements in the Lord's supper until the service is concluded. It is also called the *pall*, and its use is of the highest antiquity.

CORPORAL PUNISHMENTS. See FLOGGING.

CORPORATION (*Lat., corporatio*, "the taking of a form or body)" a body politic, or artificial person, created by the law upon the basis of one or more natural persons, having the right of succession during its continuance, and capable of acting in many respects, however numerous such natural persons may be, as a single individual. Three distinct factors are to be recognized as essential to its existence; i.e., (1) One or more natural persons, who are the incorporators, or so-called members; (2) One or more trustees, managers, or directors, who have the general control of its affairs, and may or may not include all, and be coincident with the incorporators, and (3) The corporation, or artificial person, created by the *fiat* of the law, and always separate and distinct from both its members and its trustees or managers. It is this separate existence, as a legal entity, which distinguishes it from a partnership and from a joint stock company.

Corporations are classified as to either the number of members, or the objects for which they are formed, or the fullness and completeness of their powers. With regard to the number of members, they are either *aggregate* or *sole*. An aggregate corporation has more members than one, and is the more common form. A sole corporation consists of a single member and his successors, who are by law invested with the same capacities as an aggregate corporation. Thus the King of England, or a bishop, is a sole corporation. A very few sole corporations exist in the United States. In New

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York, for example, a joint stock company composed of seven or more members may sue and be sued in the name of its president, and the president is for this purpose a sole corporation. With respect to the purposes of their existence, corporations are classified as *ecclesiastical* and *lay*, and the lay are subdivided into *civil* and *eleemosynary*. Ecclesiastical corporations are concerned wholly with religious matters, including the management of ecclesiastical property, and are composed wholly of spiritual persons. There are none such, properly so-called, in the United States. An eleemosynary corporation is formed for purposes of charity, in the legal sense of that word, i.e., general public benefit and utility. Examples are found in schools, colleges, and hospitals. Civil corporations are those that are formed for temporal purposes. They are either (1) *public* or *municipal*, i.e., created for governmental purposes, such as cities and villages, or, (2) *private*, including others of a civil nature, such as railroad companies and manufacturing and general business corporations. Since municipal corporations are part of the machinery of government, they may be dissolved, restricted, or modified at the will of the legislature; but an act which creates a private corporation is in the nature of a contract, and, because of that provision of the United States Constitution which forbids the states to pass any law impairing the obligation of contracts, cannot be repealed or materially altered or impaired against the will of the corporation. The operation of this rule is obviated in some states by constitutional provisions, or by special clauses in the acts creating corporations, to the effect that the legislature shall have power to abrogate or modify such acts. The divisions of corporations with reference to their powers is into *complete* and *quasi*. Those are *quasi* which possess some, but not all, of the ordinary powers of a corporation. Counties, school districts, and, in some states, as New York, towns afford examples.

The methods of creating corporations are by charter or letters patent from the Crown, by legislature act and by prescription. Some corporations which trace their origin to Royal Charter exist in the United States; while others may be found which derive their franchise from immemorial usage or prescription; but the most common mode of forming them is by act of the legislature. This latter method is either by special act or charter, or by a general law, which enables persons so desiring, by conforming to prescribed conditions and formalities, to become *ipso facto* a corporation. The formation under a general law is most favored.

The powers of a corporation are those given by its charter, or the general law under which it is organized, or fixed and determined by usage when it exists by prescription, together with those which are implied by law as reasonably necessary or proper to enable it to exercise its express powers, and to realize the objects for which it exists. They include the power to make contracts; to sue and be sued; to hold property; to have a corporate seal; to make by-laws, and to elect and remove members and officers. If it exceed its proper functions, it is said to act *ultra vires*. A contract *ultra vires* is, according to the weight of authority, void; but corporations have been held liable for torts resulting from their negligent performance of unauthorized acts. It was formerly held that a corporation could legally perform no act except under its corporate seal; but it may now act without a seal where natural persons may do so. The quantity of land which it may hold is usually fixed by its charter or a general law, and is commonly restricted in this country to so much as is necessary for the proper conducting of its business. It cannot take real property by will, except for charitable purposes. A corporation has never been held liable for a crime, except in cases where injury has resulted from its neglect of a duty required of it by law. It can commit torts the same as a natural individual.

The right of *visiting* a corporation is that of exercising legal superintendence and control over its actions. It is an absolute, summary power which is not reviewable by the courts, unless its arbitrary exercise would result in gross injustice. It is strictly applicable only to ecclesiastical and eleemosynary corporations; the visitor of the former being the bishop of the diocese and of the latter, the founder and his heirs, or persons appointed by the founder. In the United States, the visitors of charitable corporations are usually their trustees. Civil corporations are subject to the general law, are amenable to the process of the courts, and for misuse of powers or flagrant wrongs may be dissolved by proceedings instituted in behalf of the state.

A corporation may be dissolved by legislative act; by judicial decree; by surrender of its franchise and acceptance of the same by the state, or by the death of so many members that not enough are left to elect new members pursuant to its charter. The power to dissolve by legislative act is unlimited in England, but in the United States, it is restricted as pointed out above. A judicial decree dissolves for the violation of the conditions of the charter or the law under which it exists. Upon dissolution, the property of the corporation becomes a trust fund. If the institution were charitable, this fund is administered by new trustees appointed by the court.

CORPS DIPLOMATIQUE (French, diplomatic body). The embassadors and diplomatists, chosen to represent their respective governments, assembled at court, or the capital of a country.

CORPSE-CANDLE. See CANDLE.

CORPS LÉGISLATIF, the name of the lower house of the French national legislature under Napoleon III. from 1857 to 1870. Members were elected for six year terms.

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CORPULENCE. See OBESITY.

CORPUS CATHOLICO'RUM, a name given in Germany after the peace of Westphalia to the Roman Catholic division of the empire. The elector of Mayence was at the head, or president, of the corpus catholicorum, which generally held its meetings in a convent of that city in which the diet happened to meet. The corpus catholicorum was extinguished by the abolition of the German empire in 1806.

CORPUS CHRISTI, city and co. seat of Nueces co., Tex.; on Corpus Christi bay and the Mexican National and the San Antonio and Aransas Pass railroads; 230 miles s.w. of Galveston. It has a good harbor and large coasting trade. Pop. '90, 4387.

CORPUS CHRISTI, Oxford. This college was founded in 1516 by Richard Fox, bishop of Winchester, under a license from king Henry VIII. The statutes were issued in 1517. The foundation consisted of 20 fellows and 20 scholars; of whom the fellows were to be elected from the scholars, while the scholars were to be elected from certain specified counties. Two peculiarities marked this foundation. First, the usual rules of life and discipline were enforced with peculiar severity; and, second, the object of the college was expressly connected with the studies of the age. Classical literature was for the first time distinctly mentioned. The subjects of the lectures were enjoined to be, not the old routine of divinity and the two philosophies, but divinity, humanity, and Greek. Incessant industry in these pursuits was inculcated by the founder, and the fellows were even forbidden to accept the proctorship, lest the avocations of that office should interfere with their proper duties. The object and the stringency of these regulations called forth the celebrated encomium of Erasmus, that what Colossus was to Rhodes, what the Mausoleum was to Caria, that C. C. college would be to the kingdom of Great Britain. This prediction has hardly been fulfilled. The rules of the founder have been gradually set aside by acts of parliament, by custom, and by injunctions of the visitor. Of the three university lectureships contemplated by the founder, one was never founded at all, and the other two were merged in the college fellowships and tutorships. And, lastly, the college has suffered greatly from the severe restrictions imposed by statute upon the elections to fellowships. In virtue of the powers conferred by 17 and 18 Vict. c. 81, important changes have been effected by the college working in harmony with the commissioners. Both fellows and scholars are now elected without any restrictions as to place of birth. The fellowships are still 20 in number, value rather more than £300 a year. The college is now one of considerable eminence. Two of the fellowships are permanently attached to the two professorships of Latin and Jurisprudence, the professors being admitted honorary fellows of Corpus, and each receiving from its revenues a sum of £600 a year. The scholarships are 24 in number, tenable for five years, and of the annual value of £80, with rooms rent free; besides seven exhibitions recently instituted to be competed for annually by the commoners of the college. There are 22 benefices in the gift of this college; and in the year 1881, there were about 280 names on the college books.

COR'PUS CHRIS'TI, or BE'NET COLLEGE, Cambridge, was founded by two guilds or fraternities of townspeople—the guild of C. C., who had their prayers at St. Benedict church; and the guild of the Blessed Virgin, who prayed at St. Mary's. These were united in 1352, and a small college erected by them. Archbishop Parker added largely to the endowments of this college, and bequeathed to it his valuable manuscripts, amongst which are the only authentic manuscript copies of the 39 articles of the church of England. Of the 12 fellows, all except 4 must take holy orders. There are 31 scholarships, some of considerable value, given to the students who most distinguish themselves at the annual examinations. Among the eminent men of this college were Hugh Latimer, archbishops Parker and Tennison, Fletcher the dramatist, and Gough the antiquary.

CORPUS CHRISTI FESTIVAL, the most splendid festival of the Roman Catholic church. It was instituted in 1264, in honor of the consecrated host, and with a view to its adoration, by pope Urban IV., who appointed for its celebration the Thursday after the festival of the Trinity, and promised to all the penitent who took part in it indulgence for a period of from 40 to 100 days. The festival is chiefly distinguished by magnificent processions. In France, it is known as the *Fête Dieu*.

COR'PUSCLES, BLOOD. See BLOOD.

CORPUS'CULAR ACTION, and CORPUSCULAR PHILOSOPHY. See ATOM.

CORPUS DELIC'TI, a criminal law term used in Scotland to signify the body or substance of the charge. Before a conviction can take place the fact libeled must be proved—e.g., before a man can be convicted of murder, it must be clearly made out that there was a murder; and it is this fact that is called the corpus delicti.

CORPUS DOCTRI'NÆ, collections of writings which were intended to have authority in the Protestant churches of Germany. The chief collection was *Corpus Philippicum*, containing the Apostolic, the Nicean, and the Athanasian creeds, the Augsburg confession, and Melanchthon's *Loci Communes*. This, and similar collections were superseded by the *Formula Concordiæ*.

CORPUS JURIS. See LAW.

CORPUS JURIS CANON'ICI. See CANON LAW.

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CORRAL (Spanish) a name given in some parts of the west to a cattle pen. See RANCHE.

CORRE'A DA SERRA, JOSÉ FRANCISCO, 1750–1823; a Portuguese politician and scientist, who was educated and took orders in Rome. With the assistance of the duke of Alafoes, he founded the Portuguese academy of science, in Lisbon, and was made perpetual secretary, with the privilege of publishing its transactions without reference to censorship. He soon came in conflict with the church, through the inquisition, and fled to France, and afterwards went to England, where he became secretary to the Portuguese legation. In 1813, he came to New York; and in 1816, he was made Portuguese minister at Washington; in 1820, was called home. He ranked high as a botanist.

CORRECTION, HOUSE OF, a prison for the reformation of petty offenders. See PRISON; REFORMATORY SCHOOLS.

CORRECTION OF THE PRESS. This is one of the most important of the many operations that every piece of printed matter must undergo before it is put into the hands of the reading public; and in every considerable printing establishment, it forms a special department executed by one or more functionaries, technically called "readers." The

'To rule the nations with imperial sway, to impose terms of peace, to spare the humbled, and to crush the proud, resigning itto others to describe the courses of the heavens, and explain the rising stars; this, to use the words of the poet of the Æneid in the apostrophe of Anchises to Fabius in the Shades, was regarded as the proper province of a Roman. The genius of the people was even more adverse to the cultivation of the physical sciences than that the European Greeks, and seen we have that the latter left experimental philosophy chiefly in the hands of the Asian and African colonists. The elegant literature and metaphysical speculations of Athens, her histories, dramas, epics, and orations, had a numerous host of admirers in Italy, but a *feeling* of indifference was displayed to the practical science of Alexandria. [This repugnance of the Roman mind at home to mathematics and physics, extending from the Atlantic to the Indian Ocean, from Northern Britain to the cataracts of the Nile, annihilated in a measure all pure sciences in the conquered districts where they had had been pursued, and prohibited attention to them in the mother country.

Long, indeed, after the age of Ptolemy, the school in connection with which he flourished, remained in existence; &c.

^ *together with the prevalence of its military despotism abroad,*

1. A wrong letter. A line is drawn through the wrong letter, and the proper one written in the margin. After every mark of correction a line / should be drawn, to prevent its being confounded with any other in the same line. 2. A word or letter to be transposed. Where letters only are to be transposed, it is better to strike them out, and write them in their proper sequence in the margin, like a correction. 3. A *space* wanted. This mark is also used when the spacing is insufficient. 4. A space or quadrat *sticking up*. 5. Alteration of type. One line is drawn under the word for *italics*, two for SMALL CAPITALS, three for CAPITALS. 6. Correction or insertion of stops (*points*). 7. A word struck out, and afterwards approved of (Lat. *stet*, let it stand). 8. A turned letter. 9. An omission. 10. A letter of a wrong font. 11. A word or letter to be deleted. 12. Alteration of type. 13. A new paragraph. This should be avoided as much as possible, as it causes great trouble and expense. 14. Insertion of a sentence. 15. A *space* to be removed or diminished. 16. A wrong word. This is struck out, and the proper one written in the margin. 17. When letters or lines do not stand even. 18. Mark for a hyphen or rule. 19. No new paragraph. This is also troublesome and expensive. 20. The manner in which the apostrophe, inverted commas, the star, and other references, and superior letters and figures are marked.

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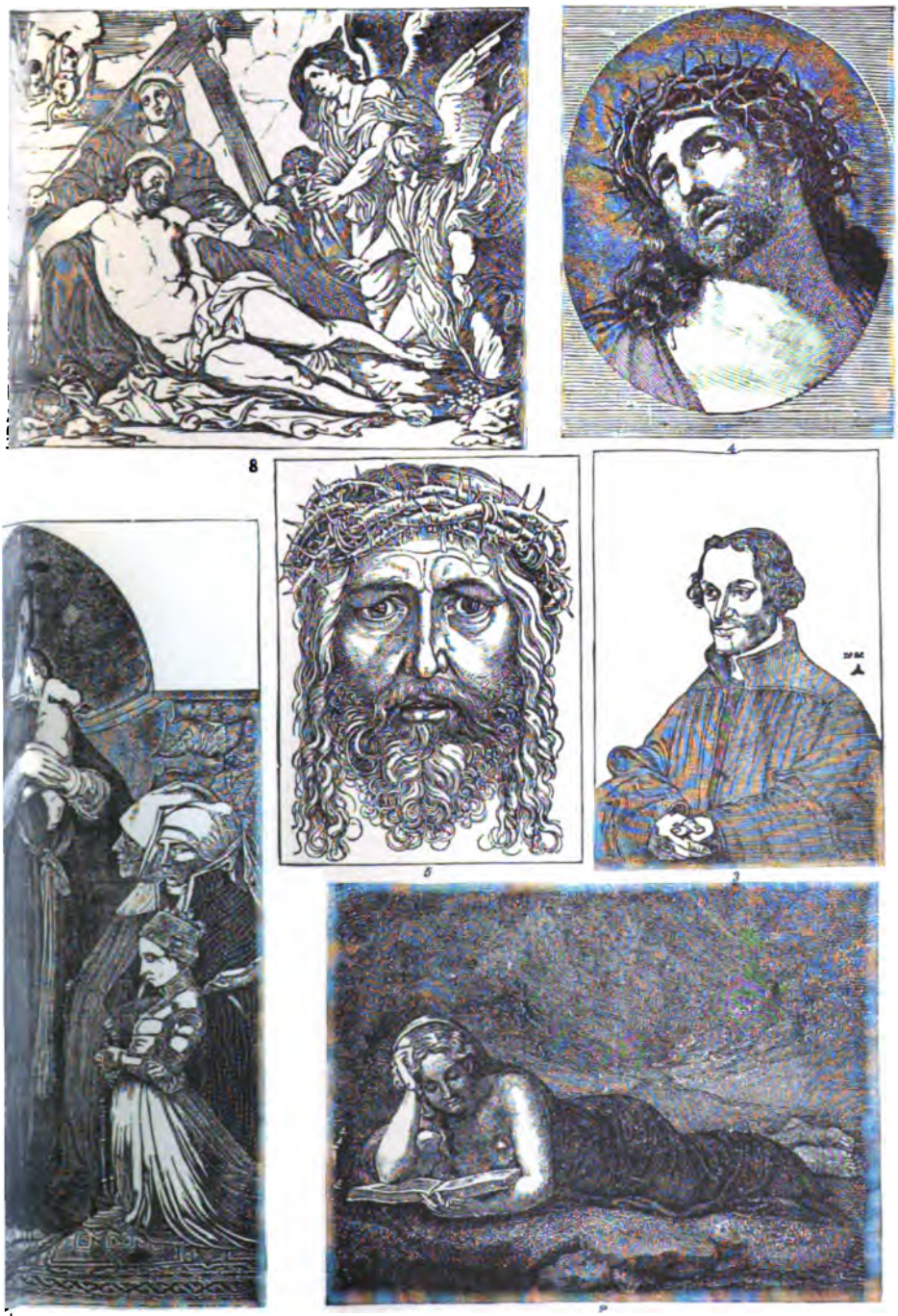






CORREGGIO, ETC.—1. Night. 2. Reading Magdalen, Correggio. 3. Melancthon, Lucas C
by himself. 7. Portrait of Van Dyck, by himself. 8. After the Crucifixtion, Van D

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ranach. 4. Ecce Homo, Carlo Dolci. 5. Suffering Christ, Durer. 6. Portrait of Durer,
yck. 9. Madonna of the Meyer Family, Holbein.

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immediate object of a corrector of the press, or "reader," is to observe and mark every error and oversight of the compositor, with a view to make the printed sheet a perfect copy of the author's manuscript. This is on the supposition that the manuscript itself is quite correct, which is seldom the case; and therefore the duty of a good reader extends to seeing that there are no inconsistencies in orthography, punctuation, abbreviations, etc., and in many cases to the verification of quotations, dates, and proper names. The duty of securing consistency in spelling and punctuation is especially important in the case of works on which several writers are employed, such as newspapers and cyclopædias. The corrector has also to direct his attention to the numbering of the pages; to the arrangement of chapters, paragraphs, and notes; to running titles, etc. It is part of his business to observe the mechanical defects of the work—defective types, turned letters, inequalities of spacing between words, sentences, and lines, crooked lines, and to secure symmetry in verses, tables, mathematical operations, and such like. In almost all cases, two proofs are taken, and in difficult works, such as those in foreign languages, tables, etc., even more. Lastly follows the revision, in which little more is done than seeing that the compositor has made all the corrections marked on the last proof. It is usual for the writer or author to reserve the correction of the second proof for himself.

In printing regular volumes, one sheet is usually corrected at a time; but where extensive alterations, omissions, or additions are likely to be made by writer or editor, it is more convenient to take the proofs in long slips, before division into pages. The corrections to be made are marked on the margin; and for this purpose an established set of signs or short-hand is used, understood by all printers, and which it is often useful to know. The specimen of a proof on the preceding page exhibits the application of most of these signs.

The thankless and monotonous business of a corrector or reader is more difficult than the uninitiated would believe. It requires extensive and varied knowledge, accurate acquaintance with the art of typography, and above all, a peculiar sharpness of eye, which, without losing the sense and connection of the whole, takes in at the same time each separate word and letter. After the invention of printing, the C. of the P. was executed by the publisher himself, or at least was intrusted to men of ability and learning, and often men of name. Robert Stephen (1526–59), and Plantin (1555–89), had recourse to publicity, hung out the successive sheets of their publications, and promised a reward to any one who would point out a typographical error. Some editions of particular works are held in high estimation from the care with which the press had been corrected. Among the most famous are those that issued from the press of Aldus Manutius in Venice, of which we may mention the works of Petrarch (1514), corrected by Pietro Bembo; Aristotle (1551–53, 6 vols.), corrected by the famous Greek scholar, J. B. Camotius; Lactantius (1515), and Suetonius (1516), corrected by J. B. Egnatius; Plato (1513), Athenæus (1514), and Gregory Nazianzene (1516), corrected by Marcus Massurus. The first edition of Homer was printed by Nerlius in Florence (1484, 2 vols.), corrected by Demetr. Chalkondylas. Robert Stephen of Paris himself corrected the numerous works that issued from his press; and Erasmus had a great name as a corrector.

CORREG'GIO, a t. of northern Italy, province of Reggio nell' Emilia, midway on the railway between Parma and Modena; pop. 12,000. It is very handsome, regularly built, and has a castle, a cathedral, and a theater. It was a barony of the lords of Correggio, who were great patrons of letters. It is the birthplace of the painter Antonio Allegri, surnamed Correggio; and of the engraver Jesi, etc.

CORREG'GIO, ANTONIO ALLEGRI, a celebrated Italian painter, called C. from the place of his birth, a town in the province of Reggio nell' Emilia. He was born in the year 1493–94, and his father, a tradesman of some property, had him carefully educated, and instructed in the rudiments of art, by an uncle, Lorenzo Allegri, a painter of small merit. How much he owed to his teacher is uncertain. He was the first among the moderns who displayed that grace and general beauty and softness of effect, the combined excellences of design and color with taste and expression, for which he is still unrivaled. His chiar-oscuro is perfect. Almost before he had seen the great masters, he became a master in a style all his own; and was the founder, or rather his imitators for him, of what is called by some the Lombard, by others the Parma school of painting. On first beholding at Bologna, Raphael's glorious picture of St. Cecilia, he is said to have exclaimed: "Anch'io sono pittore" (I, too, am a painter). But this story is doubted.

There was long a tradition that C. lived in indigence, unaided but by his own genius; and it is remarkable that Vasari, who lived at the same time, in his *Lives of the Painters*, records only vague rumors regarding C.'s life; and that Annibale Caracci, fifty years after his death, writes: "I rage and weep to think of the fate of this poor Antonio: so great a man—if, indeed, he were not rather an angel in the flesh." This belief, so prevalent in his own day, now refuted by recent researches, proves how retired and simple must have been his life. That he was in high estimation in his later days, is proved by his signature being found affixed to the deed of marriage of the lord of Correggio, celebrated in 1533. C. died the following year, Mar. 5, 1534, in his 41st year, and is buried in the Franciscan convent of Correggio.

At the age of 18, C. painted an altar-piece, the "Madonna di San Francesco," now

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in the Dresden gallery, which is rich in pictures by C.; the most famous of which are the "Notte" (Night), lighted only by the celestial splendor beaming from the head of the infant Saviour—Vasari calls it "quite wonderful"—and the famous "Magdalen," one of the most admired pictures in the world. For the cupola of the church San Giovanni at Parma, he painted an "Ascension" in fresco, and over the high-altar a "Coronation of the Virgin," now only known through copies and engravings. He also decorated elaborately in fresco the cathedral there, for which he received 1000 ducats, worth about £3,500. In the Louvre are two pictures—the "Marriage of St. Catharine," and the "Antiope;" in the Florence gallery, three—one the "Madonna on her knees adoring the Infant;" in the Naples gallery, three—one a lovely Madonna, called, from its oriental character, "La Zingarella" (the Gypsy), said to be a likeness of C.'s wife; at Vienna, two; at Berlin, three; at Parma, five—the most celebrated is the "St. Jerome;" and in the British national gallery, a Madonna, known as the "Vierge au Panier," the "Education of Cupid," and the famous "Ecce Homo," purchased by the British government for £11,500. See adjoining illus., figs. 1, 2.

CORREGI'DOR is the name given in Spain to the principal magistrate of a town. He is appointed by the king. The C. is also a Portuguese functionary, but, unlike his Spanish brother, does not possess the double power of governing and administering justice, but only the latter.

CORRELA'TION OF PHYSICAL FORCES. See FORCE.

CORRESPONDENCE CLASSES. See CHAUTAUQUA.

CORRÈZE, a department of France, formed out of part of the old province of Limousin, and taking its name from an affluent of the Vezère, the Corrèze, which traverses the department from n.e. to s.w. C. extends between lat. 44° 55′ and 45° 40′ n., and long. 1° 13′ and 2° 22′ e.; its total area is nearly 2,265 sq. m., and its pop., in 1896, 322,303. The chief rivers of C. are the Dordogne, the Vezère, and the Corrèze. The surface of the department is mountainous, especially in the n. and e., where it is broken in upon by offsets from the Auvergne mountains, which range from 2500 to 3320 feet (Mt. Besson) above the sea. The lower slopes are clad with forests, but the district is in general sterile. In the s. and s.w., however, the soil yields wheat, oats, barley, rye, maize, etc. Wine is also produced, but of poor quality. The rural population are poor, badly housed and fed; their food consisting, to a great extent, of chestnuts, which are very abundant. Minerals, particularly coal, iron, lead, alabaster, and granite of various colors, are found in considerable quantities.

COR'RIB, LOUGH, a lake, the third in size in Ireland, in the n. of Galway. It is of very irregular shape, 27 m. long from n.w. to s.e., and 1 to 6 broad, with an area of 68 sq. miles. It is between 28 and 31 ft. above the sea-level. From its s. end, 4 m. n. of Galway, it discharges its surplus waters by Galway river into Galway bay. It receives the waters of Lough Mask, at its n. end, through the Pigeon Hole and other caves, as well as those of the Clare and other smaller rivers. On its sides are metamorphic rocks, carboniferous limestone, and marble. Near it are many monumental heaps and so-called Druid circles. It contains many islets, and to the w. are mountains 3,000 ft. high.

COR'RIDOR is a gallery or passage running (It. *correre*, Sp. *correr*, to run) or leading to several rooms, each of which has a door opening into it. Spacious corridors are necessary in all public buildings, such as hospitals, prisons, etc.

CORRIE, DANIEL, 1777–1837; a native of England, who was appointed archdeacon of Calcutta in 1823, and bishop of Madras in 1835. He was a laborer in missions with Buchanan, Martyn, Heber, and Turner. He translated prayers, homilies, and other religious works into Hindustanee, and made an ancient history in English for schools in India.

CORRIEN'TÉS (in English, *currents*) is a name of various application in Spanish America. Besides indicating several capes in Cuba, Mexico, and New Granada, it is more conspicuously connected with one of the states of the Argentine Confederation and with the capital of the same. 1. C., the city, stands in lat. 27° 27′ s., and long. 58° 46′ w., near the confluence of the Parana and the Paraguay. It takes its name from the rapids, which are said to be as decidedly a turning-point in the climate of the country as in the navigation of the river. Pop. '95, 16,000. 2. C., the province, lies between Entre Rios on the s., and the republic of Paraguay on the n., having the Parana on the n. and w. Lat. 27° to 30° s., and long. 57° to 59° w. Area 54,000 sq. m.; pop. '95, 239,570. The surface is generally undulating and fertile, but contains many shallow lakes and swamps, the largest being the Laguna Ibera. The products are maize, cotton, sugar, indigo, tobacco, and a species of silk.

CORRIEVREK'IN, or CORRYBRECH'TAN, or gulf of Brechan, a whirlpool or dangerous passage a mile broad, off the w. coast of Argyleshire, in the strait between Scarba and Jura isles. It is occasioned by the meeting of tides (often running 12 or 14 m. an hour) from the n. and w., in the narrow passage into the sound of Jura, round a pyramidal rock, which rises with rapid slope from a considerable depth to some fathoms from the surface. This rock forces the water in various directions. In stormy weather, at flow-tide, vast openings form in the water, immense bodies of water tumble head-

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long as over a precipice, then rebounding from the abyss, dash together and rise in spray to a great height. The noise is heard over the isles around.

CORRIGAN, MICHAEL AUGUSTINE D.D., b. Newark, N. J., 1839. He graduated at Mt. St. Mary's coll., Md., 1859; went to Rome to complete his studies, and was ordained there in the Rom. Cath. church. Returning home he was appointed a prof. at Seton Hall coll., of which he became pres., 1868. He filled the offices of administrator and vicar-gen. of the Newark diocese, 1870; was consecrated bp. of Newark, 1873; and was appointed coadjutor abp. to Cardinal M'Closkey, 1880, succeeding him, 1885.

CORROBOREE (Corrobory, or Corrobery), the native name of a weird war dance held by the aborigines of Australia and New Zealand. The term is also applied to a dancing party in which the natives assemble.

CORRO'SIVE SUBLIMATE, the popular name of bichloride of mercury (q.v.).

COR'RUGATED IRON (Lat. *ruga*, a wrinkle). Common sheet-iron, and what is improperly called "galvanized iron" (i.e., sheet-iron coated with zinc by immersion in a bath of the fused metal), have of late been made available for many useful purposes, by virtue of the great additional strength imparted to the sheets by corrugation, which is merely an application to metallic substances of the old contrivance of "goffering or crimping," by means of which the frills of the olden time were made to keep their shape.

The sheets of metal are passed between rollers, the surfaces of which are formed into rounded grooves and ridges, the ridges of one roller filling the grooves of the other. The metal in passing between these is compressed into a waving form, or corrugated. It will be easily understood that a piece of sheet-metal, of given size and thickness, if rolled up to form a tube, will resist a much greater bending strain than when flat. Now the curves of the corrugation may be regarded as a series of half-tubes, and the additional strength is due to the application of the same principle. See STRENGTH OF MATERIALS. Walls and roofs of temporary buildings are now extensively made of this material. Railway sheds, emigrants' houses, temporary churches, store-rooms, and sheds for dock-yards, etc., are among the common applications.

CORRUPTION OF BLOOD. See TREASON.

CORRUPTION OF JUDGES. See JUDGE.

CORRUPT PRACTICES ACT. See BRIBERY.

CORRY, a city in Erie co., Penn., an outgrowth of the great petroleum speculation, situated at the crossing of the New York, Lake Erie and Western, and Philadelphia and Erie railroads, and at the terminus of other roads in the oil regions; pop. '90, 5671. It has machine shops, radiator works, and various other manufactories; but its establishment and prosperity are due to the discovery of oil, or petroleum. It was chartered as a city in 1866.

COR'SAC, *Canis* or *Cynalopex corsac*, an animal of the dog family (*canidæ*), found in the deserts of Tartary and in India. In size, it resembles a small fox, but is more slender in body and limbs; it has long and pointed ears, a bushy tail, and is of a reddish or yellowish color; the form of the head resembles that of the fox.

COR'SAIR (Ital. *corso*, a race), a pirate or sea-robber, but generally limited in its application to the pirates who in former times sailed from Algiers, Tunis, Tripoli, and the ports of Morocco, and were the terror of merchantmen in the Mediterranean and the neighboring parts of the Atlantic ocean.

CORSE, JOHN MURRAY, an American general, b. in Pittsburg, Pa., April 25, 1835. In his 18th year he went to West Point but left to take up the study of law. He entered the Union army, at the outbreak of the Civil War, and was in command of a division at Memphis. He was in command of a division in General Sherman's march to the sea. He was a collector of revenue in Chicago, and postmaster of Boston. He died April 27th, 1893.

CORSETS, appertaining to the costume of women, were introduced into France about the time of the revolution, when the French ladies adopted the Greek dress. Previous to this, they had been worn by Germans for several centuries, by whom they were invented. Bandages, resembling corsets, were used in Rome during the early ages, but only as a support, until a slender waist was considered a mark of beauty, when they were made to compress the form. They are commonly combined of firm cloth, stiff whalebone, or steel, enclosed in casings, and closed in front with steel or whalebone plates, which rest on the breast-bone vertically.

CORSICA, an island in the Mediterranean, separated from the island of Sardinia by the strait of Bonifacio on the s., and situated in lat. 41° 20′ to 43° n., and long. 8° 30′ to 9° 30′ east. It forms the French department of Corse, and has an area of 3,377 sq. m., with a pop., in '96, of 290,168. The greater portion of the island is occupied by ranges of rugged mountains, the highest being Monte Cinto (8890 ft.) and Monte Rotondo (8610 ft.) and covered with perpetual snow. There are several rivers in the island, the largest of which, having their source in Monte Rotondo, are the Tavignano (ancient *Rhotanus*) and the Golo (ancient *Tavola*). They flow into the sea on the e. coast; the Golo is navigable for boats. Several small rivers, most of which are dry in summer, flow westward into the sea. The soil is generally fertile in the valleys, yielding all kinds of cereals, and much wine is produced. Olive, orange, fig, almond, and other

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fruit-trees flourish; fruit forming a considerable item in the exports. But C. is chiefly celebrated on account of its magnificent forests of oak, pine, chestnut, beech, larch, cork, etc. Many of the pines are upwards of 120 ft. high, and are much used for masts in the French navy. The chestnut forests are particularly fine, and the fruit serves as an important article of food for the inhabitants. Prickly-pear, arbutus, myrtle, etc., abound. Iron, lead, black manganese, antimony, marble, and granite of beautiful quality, are found on the island, but these sources of wealth are not developed. Sheep of a peculiar black breed, with four and occasionally six horns, goats, and pigs are numerous, and the rearing of cattle is carried on to a great extent. Tunny, pilchard, and anchovy abound along the coast. C. is divided into the five arrondissements of Ajaccio, Bastia, Calvi, Corte, and Sartene. Ajaccio is the capital. The language spoken in C. is a corrupt Italian. The Corsicans are great *improvisatori;* valor, love of freedom, and desire of revenge are their principal characteristics.

In early times C. was known as *Cyrnos*, although its native name is said by some historians to have been the same as that it now bears. As early as 564 B.C., a colony of Phocæans had founded a city on its e. coast. After successive changes of Carthaginian, Roman, Vandal, Greek, and Gothic rulers, it came in the 8th c. into the hands of the Saracens, who held it until the beginning of the 11th c., when it fell under the dominion of Pisa. It afterwards passed to the Genoese, who held it until 1755, when the Corsicans under Gen. Paoli made themselves in great part independent. The French, to whom the Genoese surrendered the claims they themselves could not maintain, captured it in 1768; since which time, with slight intermission, it has remained in the possession of France.

CORSICANA, city and co. seat of Navarro co., Tex.; on the Houston and Texas Central and the St. Louis Southwestern railroads; 180 miles n. e. of Austin. It is the seat of the Texas state orphan asylum, and has a widows' and orphans' home, national banks, newspapers, waterworks, street railroad, cotton compress, cotton gin, flour and oil mills, brick yards, grain elevator, ice factory, etc. Pop. '90, 6285.

CORS'NED, or morsel of execration, was a piece of cheese or bread made use of in early times with a view to ascertain whether persons suspected of any crime were guilty or innocent. It was one of the many forms of ordeal (q.v.).

COR'SO (literally, course or running) is an Italian word used to express not only the racing of horses (without riders), but also the slow driving in procession of handsome equipages through the principal streets of a town, such as almost always takes place in Italy on festivals. This custom has given a name to many streets in almost all the larger towns of Italy. The best known of these is the C. in Rome, which is the scene of the celebrated diversions of the carnival.

CORSON, HIRAM, philologist, was b. in Philadelphia in 1828; he held positions in the Library of Congress and the Library of the Smithsonian Institution, and taught afterwards in Girard College, Philadelphia, and St. John's College, Annapolis, and in 1870 became professor of English language and literature in Cornell University. Has published *Handbook of Anglo-Saxon and Early English; Introduction to the Study of Browning; Thesaurus of Early English*, etc.

CORSON, JULIET, was born in Boston, in 1842; and in 1872 was made secretary of the Free Training School for Women. She devoted herself to study and experiments on healthful and economical cookery and dietetics. In 1876 she established the New York School of Cookery. She wrote many books on dietetics. D. in 1897.

CORSSEN, WILHELM PAUL, 1820–75; a German philologist, a native of Bremen, educated in the university of Berlin, and professor in the Stettin gymnasium. He published *The Pronunciation, Vocalization, and Accentuation of the Latin Language*, which is considered to be the best work thus far published on the subject. At the time of his death he was engaged on the second volume of an elaborate work on the Etruscan speech.

CORT, CORNELIS, a famous Dutch engraver, was b. at Hoorn, in 1536. In 1572, he went to Venice, and was hospitably received there by Titian. Being less of a painter than of an engraver, he seems very soon to have been employed by the great Venetian colorist for the reproduction in copper-plate of some of his master-pieces; and it appears he did it so well, that he afterwards engraved for Tintoretto and other Venetian masters. C. next settled at Rome, where he erected an engraving school, and had among his pupils Agostino Caracci, and from this school sprang the most excellent Italian and Venetian engravers. C.'s works had a favorable influence on the graver's art in the Netherlands. He died at Rome in 1578. His engravings, considering his short life of 42 years, are very numerous, amounting to more than 150.

COR'TÉS is the name given in Spain and Portugal to the assembly of representatives of the nation. As one district of Spain after another was recovered by the Christian princes from the Moors, there arose in each a corporation composed of the different "states" or orders of the population, limiting the power of the princes. From the union of several of these territories were formed the two leading kingdoms of Castile and Aragon, having each its C., representing the clergy, the nobility, and the cities. In Aragon, the C. appointed a judge, *el justicia*, who decided disputes between the king and his subjects, and confined the royal power within constitutional limits. In Castile the

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rights of the burghers were less extensive than in Aragon, but in both states the king was dependent on the Cortes. After the union of Castile and Aragon under Ferdinand and Isabella, the crown succeeded in making itself less dependent on the C., whose power and privileges were gradually encroached upon, until at last they were seldom assembled except to do homage or to sanction an arrangement as to the succession to the throne. After 1713, they did not meet till 1789, on the accession of Charles IV. In 1809, the C., as composed in 1789, was assembled by the Junta, and framed a new constitution, called the constitution of 1812, which, however, was set aside at the restoration. Endless attempts at restoration and modification of the Spanish C. have since been made, without any happy result. See SPAIN.

The history of the Portuguese C. is very similar to that of the Spanish. In 1826, Dom Pedro promulgated a new constitution after the model of the French, calling the C. again into life, and abdicating at the same time in favor of his daughter, Maria da Gloria. This constitution was set aside during the usurpation of Dom Miguel, but was finally restored in 1842.

CORTÉS, HERNAN, the daring conqueror of Mexico, was b. in 1485, at Medellin, a village of Estremadura, Spain. He was educated for the law, but afterwards adopted the profession of arms; and in 1511, distinguished himself under Diego-Velasquez in the expedition against Cuba. In 1518, the conquest of Mexico was intrusted to him by Velasquez, who was then governor of Cuba; but the latter had no sooner granted him the commission than he wished to revoke it, fearful that his dashing and sagacious lieut. would deprive him of all the glory of the enterprise. C., however, maintained his command in defiance of the governor. Never, perhaps, was an enterprise so great undertaken with so little regard for its difficulties and dangers. A force of between 600 and 700 men, only 13 of whom were musketeers, with only 10 field-pieces and two or three smaller pieces of cannon, were all the means at C.'s disposal to effect the conquest of the then extensive empire of Mexico, when, early in 1519, he landed on its shores. Sailing up the river Tabasco, C. captured the town of that name, the prowess of the Spaniards occasioning great terror to the Tabascans, who made liberal presents to the white men, and volunteered all the information about Mexico in their power. Arriving off the coast of San Juan de Ulloa, C. was here visited by some Mexican chiefs, with whom he entered into negotiation regarding a visit to Montezuma, who then ruled with nearly absolute sway over Mexico. Montezuma sent C. rich presents, but objected to his visiting the capital. But C. had resolved upon seeing the emperor in his palace, and was not to be daunted by opposition. Having founded the town of Vera Cruz, and burnt his ships, so that his troops could not return, and must, therefore, conquer or perish, C., with a force reduced to 400 Spaniards on foot and 15 horse, but with a considerable number of Indian followers, lent him by dissatisfied chiefs dependent on Montezuma, marched upon the capital. Overcoming the Tlascalans, a brave people, on the way, who after became his firm allies, and taking fearful vengeance on the city of Cholula, where, by Montezuma's orders, a treacherous attempt was made to massacre his troops, C. on the 8th Nov., 1519, reached the city of Mexico with his little band, and was received with great pomp by the emperor in person. The Spaniards were regarded as those descendants of the sun who, according to a current prophecy, were to come from the east and subvert the Aztec empire—a tradition that was worth a good many soldiers to Cortes. An attack on C.'s colony at Vera Cruz by one of Montezuma's generals, however, proved the mortality of the Spaniards, and would have been the ruin of them but for the decisiveness of C., who immediately seized the emperor, and carrying him to the Spanish quarter, forced him to surrender the offending general and three other chiefs, whom he caused to be burnt in front of the palace, and ere long compelled him formally to cede his empire to Spain. One has nothing but astonishment for this man, whose daring acts in the capital city of the empire, containing, it is calculated, 300,000 inhabitants, had nothing but 400 Spaniards, and a few thousand Indians, whom he had recently conquered, to support them. Meanwhile Velasquez, enraged at C.'s success, sent an army of about 1000 men, well provided with artillery, to compel his surrender. C. unexpectedly met and overpowered this force, and secured its allegiance. But in his absence the Mexicans had risen in the capital, and C. was finally driven out with much loss. During the disturbance, Montezuma, who was still kept a prisoner, appeared on a terrace with the view of pacifying his people; but he was wounded by a stone, an indignity against his kingly person which he took so much to heart that he died in a few days. C. now retired to Tlascala, to recruit his fatigued and wounded men; and receiving reinforcements, he speedily subjugated all Anahuac to the e. of the Mexican valley, and soon marched again on the city of Mexico, which he succeeded in capturing (Aug. 16, 1521) after a siege of four months, ended by a murderous assault of two days. Famine had assisted the Spanish arms, so that of the vast population only about 40,000 remained when the Spaniards entered the city, which lay in ruins, "like some huge churchyard with the corpses disinterred and the tombstones scattered about." Mexico was now completely subjugated, for though some attempts at revolt were afterwards made, they were soon crushed by C., who had been nominated governor and capt. gen. of the country by Charles V. In 1528, C. returned to Spain, to meet some calumnies against him, and was received with great distinction. On his return to Mexico in

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1530, however, he was divested of his civil rank. At his own expense he fitted out several expeditions, one of which discovered California. In 1540 he came again to Spain, but was coldly received at court, from which he soon retired, and died at Seville, Dec., 1547. The reader is referred to Prescott's *Conquest of Mexico* (3 vols.).

CORTLAND, co. in central New York, created from Onondaga in 1808, intersected by the Lehigh Valley, the Delaware, Lackawanna and Western, and other railroads. Area, 480 square miles; population, 1870, 25,173; 1880, 25,825; 1890, 28,657. The territory embraced within its boundaries lies upon the Military Tract, and comprises the original townships of Cincinnatus, Homer, Solon, Virgil, and the south half of Fabius and Tully. It is drained principally by the Tioughnioga river, which has its rise among the lakes and hills in the northern portion, and flows southerly through the county. Co. seat, Cortland.

CORTLAND, a village and co. seat of Cortland co., N. Y., 37 m. by rail from Syracuse, 44 from Binghamton, 50 from Canastota, and 70 from Elmira, on the Delaware, Lackawanna, and Western, and the Elmira, Cortland, and Northern railroads, and the Tioughnioga river; pop. '90, 8590. Cortland is the seat of one of the State Normal and Training Schools for teachers, established by the acts of the Legislature in 1866–7, opened in 1869. As a manufacturing centre, the village has risen rapidly into prominence and it has manufactories of spring carriages, road carts, omnibuses and sleighs, carriage-trimmings, drops, forgings, stoves, harness, chairs, desks, doors and blinds, door and window screens, steel traps, cash registers, corsets, etc. The village is lighted by electricity, has a telegraph fire alarm system, and is supplied with spring-water for fire and domestic purposes. There are electric railroads connecting the village with Homer and McGrawville, electric lights, several churches, national banks, and daily and weekly newspapers.

CORTO'NA, a t. of central Italy, about 50 m. s.e. of Florence. It is beautifully situated amid vineyards on a hill rising from the fertile valley of the Chiana, and commanding a view of the lake of Perugia (anc. *lacus Trasimenus*). The city is of fabulous antiquity, older, it is said, than Troy; and the Cyclopean walls, erected by the Pelasgians—which in many parts remain unchanged—prove, if not a history quite as old as tradition affirms, at all events one second in remoteness to few places in Italy. It was one of the most powerful of the twelve cities forming the Etruscan league. By the Romans, who settled a colony here about the time of Sulla, it was called *Corythus*. After many vicissitudes during the middle ages, the town became subject to Florence in the 15th century. Besides the walls, there are several objects of Etruscan antiquity at Cortona. The modern town contains above 3,900 inhabitants.

CORUÑA (English, *Corunna*), a fortified seaport of Spain, situated on a small headland in the Atlantic, formed by the three bays of Betanzos, Coruña, and El Ferrol, about midway between capes Finisterre and Ortegal, in lat. 43° 22′ n., long. 8° 22′ west. C., which is a thriving place, is built partly on the slope and partly at the foot of a hill, and is divided into the upper and lower towns, the former being the most ancient. The lower town, which was formerly inhabited chiefly by fishermen, is now more important than the upper. It is well built, chiefly of granite, and some of its streets are broad and well paved. There are few public buildings of any note in Coruña. A citadel defends the town, and the harbor, protected by forts, is safe and commodious. Works for the improvement of the harbor were begun in 1894. It is the terminus of the railway that traverses Galicia, and has a variety of manufactures, including cigars, linen goods, canvas, cordage, etc. Many of the inhabitants are employed in the herring and pilchard fishery. C. dates its origin from the Phenicians, from whom it was taken by the Romans in the 1st c. B.C. For Englishmen, great historical interest attaches to Coruña. Here, in 1386, John of Gaunt landed to claim the crown of Castile in right of his wife, daughter of Pedro the Cruel; in 1554, Philip II. embarked here for England to marry queen Mary; and in 1588, the great Spanish armada, which had been refitted at this port, set sail for the conquest of England. But C. is best known in connection with the death of sir John Moore, who, as a fitting conclusion to his memorable retreat, with about 14,000 men defeated (Jan. 16, 1809), on the heights of Elvina, behind C., 20,000 French under Soult. Pop. '87, 36,200.

CORUN'DUM, a mineral consisting essentially of mere alumina, yet of great specific gravity—about four times that of water—and of remarkable hardness, being inferior in this respect only to the diamond. Mineralogists regard the sapphire as a variety of C., and along with it the gems popularly known as oriental ruby, oriental topaz, oriental emerald, and oriental amethyst; but the name C. is more usually limited to the coarser varieties, to which it is applied by the natives of India. These, instead of exhibiting the brilliancy of gems, are in general of a dull and muddy appearance, and the crystals—which are usually six-sided prisms, and six-sided pyramids—are externally dull and rough. The color is various, often green, blue, or red, inclining to gray. The variety called *adamantine spar* is of a hair-brown color and adamantine luster. Some corundums—known as *asteria sapphires* or *star sapphires*—when cut in a particular manner, exhibit an opalescent star of six rays. C. is found in many parts of the world, and has long been used in India for polishing all gems except the diamond, which is too hard for it, and also for polishing the stones used in temples and other buildings. Emery (q.v.), so well known as a polishing substance, is a variety of corundum.

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CORUNNA, a province of Spain, in Galicia, forming the extreme n.w. corner of the kingdom, bordering on the bay of Biscay and the Atlantic ocean; about 3079 sq.m.; pop. '87, 613,881 It has a sinuous and rugged coast, and is traversed by mountain ridges, between which run a number of small rivers. The chief town is Corunna.

CORVÉE. An obligation imposed under the feudal law whereby the inhabitants of a district performed certain services, such as repairs of the highway, and bridges, for the sovereign, or the feudal lord. The system was enforced by the DUAL CONTROL (q.v.) in Egypt, where in 1882, 234,000 *fellaheen* were called out for 100 days to clean the irrigating canals; but the obligation was gradually abolished, until in 1887, the *Corvée* was wholly done away with, and the labor done by contract.

CORVEI (*Corbeia Nova*), a Benedictine abbey on the Weser, near Höxter, the oldest and most famous in early Saxony, founded in the beginning of the 9th century. It was a colony from the monastery of the same name in Picardy, then part of the country of the West Franks. It received rich endowments; was the center of great agricultural improvement and prosperity during the earlier part of the middle ages; and the seat of a school, founded by Ansgar, the apostle of the north, which flourished greatly in the 9th and 10th centuries, and was next in reputation to Fulda. Its abbots were numbered amongst the spiritual princes of the German empire. In 1794, it was made a bishopric by Pius VI. Its territory then extended to about 22 sq.m., with 10,000 inhabitants. In 1803, it was annexed to Nassau, from which it was transferred in 1807 to Westphalia, and in 1815 to Prussia. In 1822, the lands belonging to the ancient abbey passed into the hands of count Victor Amadeus von Hessen-Rheinfels-Rothenburg, which were formed into a mediate principality of the Germanic empire. The church of the abbey is built in the Gothic style, very magnificently adorned in the interior, and contains a multitude of monuments of successive dynasties. The library and archives of the cloister, which contained most valuable records of the early ages of German history, have all been destroyed—the authenticity of the *Chronicon Corbejense*, an alleged record of this abbey from its foundation to the end of the 12th c., being doubtful.

CORVETTE', is a flush-decked vessel, ship-rigged, but without a quarter-deck, and having only one tier of guns.

COR'VIDÆ, a family of birds of the order *insessores*, tribe *conirostres*, having a strong bill, compressed towards the point, and covered at the base with stiff, bristly feathers, which advance so far as to conceal the nostrils. The plumage is dense, soft, and lustrous, very generally dark, but sometimes of gay colors, more particularly in the tropical species. The birds of this family are widely diffused over the world. They are generally birds of strong and rapid flight; some of them are solitary, some gregarious in their habits; some reside in woods, some in moors and wastes, some on sea-coasts, etc. They are very omnivorous. They are also remarkable for their intelligence, their prying curiosity, and their disposition to pilfer and secrete glittering articles. Besides the crows, raven, rook, and jackdaw, which belong to the genus *corvus*, the magpie, jay, chough, and nut-cracker are included among the C. of Britain.

CORVINUS, MATHIAS. See MATHIAS CORVINUS.

COR'VO, the most northerly of the Azores, is the smallest among the inhabited islands of the group. It measures only 6 m. by 3, the latitude of its southern point being 39° 42′ north. It is of volcanic origin, and has, in an exhausted crater, a small lake.

CORVUS, M. VALERIUS, a general of the early Roman republic, b. about 370 B.C. He was twice dictator and six times consul, and occupied the curule chair 21 times. He defeated the Gauls, the Volsci, the Samnites, the Etruscans, and the Marsi. He lived to be 100 years old.

CORWIN, THOMAS, 1794–1865; b. Ky.; a lawyer, practicing in Ohio, where his eloquence soon made him politically prominent. He was a leading member of the whig party, and a member of congress in 1830. In 1840, he was chosen governor of his state; in 1845, elected to the U. S. senate, where he made a powerful speech against the proposed war with Mexico. In 1850, he was secretary of the treasury; in 1858, again a member of congress; and in 1861, minister to Mexico. He was a man of great force of character.

CORYBAN'TES, priests of Cybele, in Phrygia, who celebrated her worship by dressing in full armor and performing loose dances to the music of flutes and cymbals. It is said that under the influence of the music and the dance they became insane, and were supposed to be possessed by spirits. In Rome the priests of Cybele were called Galli.

CORYDAL'IS. See FUMARIACEÆ.

CORYELL, a co. in central Texas on Leon river; 1000 sq.m.; pop. '90, 16,816, inclu. colored. The surface is rolling or hilly, with timber-land and prairie. Stock-raising is the principal business. Co. seat, Gatesville.

CORYGAUM', or KORIGAUM, a village in the presidency of Bombay, is historically interesting in connection with the final subjugation of the Peishwa of the Mahrattas. On 1st Jan., 1818, it was defended for nine hours by a mere handful of men under Capt. Staunton against a native force numbering at least 3000 infantry and about 20,000

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cavalry, the struggle terminating in the repulse of the assailants after terrible slaughter. C. stands 16 m. to the n.e. of Poona, in lat. 18° 39′ n., and long. 74° 8′ east.

CORYLA'CEÆ. See CUPULIFERÆ.

COR'YLUS. See HAZEL.

COR'YMB, in botany, a form of *indefinite* and *centripetal* inflorescence, in which the flowers are arranged as in a raceme (q.v), but the lower flower-stalks are elongated so as to bring the flowers almost to the level of those of the upper. The C. is a very common form of inflorescence.

CORYMBIF'ERÆ. See COMPOSITÆ.

CORYM'BUS (Gr. *korumbus*), the particular mode of dressing the hair among the Greeks, with which the statues of Venice have rendered us familiar. The hair was often covered with a sort of open ornamental work.

COR'YPHA. See FAN PALM, GEBANG PALM, and TALIPAT PALM.

CORYPHÆ'US (from Gr. *koruphe*, a summit), the leader of the chorus in ancient Greece. The name is now used to signify those of the highest distinction in any art or science. In the Italian opera the choir-leader is called the *corifèo;* in French, *coryphée.*

COR'YPHENE, *Coryphæna*, a genus of fishes of the family *scomberidæ*, to which the name DOLPHIN, properly belonging to a genus of *cetacea*, has by some mistake been popularly transferred. The coryphenes are remarkable for the beauty and metallic brilliancy of their colors, which delight the spectator as they are seen gliding with extreme rapidity near the surface of the water, gleaming in the light of the sun; and the changes of which, as they lie dying on the shore or on the deck of a vessel, have acquired a peculiar poetic celebrity. They have an elongated compressed body, covered with small scales, the head rising in a sharp crest, the mouth large. They are natives of the seas of warm climates, and some species are found in the Mediterranean, among which is the *C. hippuris*, the largest known, attaining a length of 5 feet. This and some of the other species are often seen playing around ships; and great interest is occasionally awakened by their pursuit of shoals of flying-fish. In this chase, a C. may be seen to dart completely out of the water, making a leap of 10 yards or more. Capt. Basil Hall likens the velocity to that of a cannon-ball. The C. is often caught by sailors, with a glittering bit of metal instead of a bait.

COS (more anciently Meropis), an island of the Grecian archipelago belonging to Asiatic Turkey. Its modern name is Stanko or Stanchio. C. has a length of 23 m., with a breadth of 5, and a pop. of from 20,000 to 30,000, the half of whom are Greeks; the other half being Turks and Jews, who congregate in the towns. On the eastern side of the island a range of hills extends along the coast, from cape Fonka on the n., to point Korkilo on the s.; but with this exception, C. consists mostly of delightful and fertile plains, which are well cultivated. S. of these plains, on which stands the principal town, of the same name as the island, rises a high mountain range, which, from its jagged summit, is called mount Prion—the "sawing" mount, or sierra. There are many mineral springs on the island. The exports consist principally of raisins, lemons, salt, and grain. They amount annually to about $250,000. The chief imports are oil, soap, butter, butcher-meat, and English manufactures. The climate in general is pretty healthy. Many ancient Greek remains are scattered over the island. The chief town, Comopolis or Cos, is situated on the n.e. coast. It is built on the ruins of the ancient city of the same name; and in the center of the chief street is a gigantic palm-tree, said to have stood there before the Christian era. To the n.w. is an old fortress of the knights of St. John. The harbor is small, with only about 6 ft. of water in it. The inhabitants are employed chiefly in agriculture. Modern Greek is the language spoken. In early times C. was sacred to the worship of Æsculapius. It was the birthplace of Ptolemy Philadelphus, of the painter Apelles, and the physician Hippocrates.

COSCIN'OMANCY, a species of divination practiced from the earliest times by means of a sieve (Gr. *koskinon*) and a pair of shears or forceps. It appears to have been chiefly employed for the discovery of thieves. The sieve was supported or suspended by means of the shears, in some way not easily understood; a certain mystical form of words was then used, and the names of the suspected persons being mentioned in succession, at the name of the thief the sieve moved or turned round.

COSEN'ZA, a province in Calabria, s. Italy, between the gulf of Tarento and the Mediterranean; 2,563 sq. m.; pop. '95, 469,839. The region is mountainous, being traversed by the Apennines down to the sea. The vine, the olive, silk and fruits are cultivated.

COSEN'ZA, a t. of Italy, capital of the province of the same name, about lat. 39° 20′ n., long. 16° 15′ east. It is situated 12 m. e. of the Mediterranean, in a mountain-inclosed valley at the confluence of the Crati and the Busento, the waters dividing the town into two parts. The lower town is much affected by malaria arising from the river marshes, but the upper town is tolerably healthy. It is the residence of the principal families, and contains some handsome buildings, including a cathedral, and an unusually fine court-house. The streets generally are narrow and crooked. C. has considerable industry, the principal articles of manufacture being silk, earthenware, and cutlery. Pop. 94, 20,400. Anciently, C., called *Consentia*, was a city of the Brutii. It was

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captured by the Carthaginian general Himilco, and was forced to surrender (204 B. C.) to the Romans, who afterwards colonized it. Alaric the Goth died here 410 A. D., and is said to have been buried in the bed of the Busento, the river having been turned from its course and brought back when the body was placed in the grave.

COSHOC'TON, a co. in central Ohio, on the Muskingum river and its tributaries, the Ohio canal, and the Pittsburg, Cincinnati, Chicago, and St. Louis and other railroads; 550 sq. m.; pop. '90, 26,703. The surface is hilly, and the soil is generally productive; wheat, corn, oats, butter, and wool are the chief productions. Co. seat, Coshocton.

CO-SINE, CO-TANGENT, etc. See TRIGONOMETRY.

COS'MAS, surnamed *Indicopleustes*, a merchant of Alexandria, who lived in the middle of the 6th c., and after having traveled much, returned to Egypt, where he spent the evening of his days in monastic retirement, and wrote a *Christian Topography* in 12 vols., in the Greek language, containing much information about many countries, and particularly about India. An attempt to reconcile everything to his notions of the meaning of the Bible has led him into many errors. The work (which, among other things, gives the first account of the *Monumentum Adulitanum*, see ADULE) has been edited by Montfaucon in the *Nova Collectio Patrum Græcorum*, vol. ii. (Par. 1707). C. wrote also a description of the plants and animals of India, which was published by Thevenot in his *Relations de Divers Voyages Curieux*, vol. i. (Par. 1666).

COSMETICS (Gr. *kosmeo*, I adorn) are chemical preparations employed for improving the appearance of the skin and hair. Several of the C. in use are comparatively harmless, such as perfumed starch and chalk; whilst others, such as *pearl white* (the subnitrate of bismuth), are more or less poisonous, and dangerous to use. At all times, the employment of C. is not to be commended, as the minute particles tend to fill up and clog the pores of the skin, and prevent the free passage of gases and vapors, which is so essential to the preservation of any animal organ in a thorough state of health. The beauties of past ages employed many harmful as well as repulsive mixtures, bathing their faces in mercury and even human blood. Among preparations for beautifying the eyes the *Kohl* of the Egyptians is the most famous. This was a compound of various ingredients, and was applied to the eyes by a bodkin. It is still is use in Oriental countries. Perfumes (q.v.) are also a branch of cosmetics.

COSMO DE' MEDICI. See MEDICI.

COSMOG'ONY (Gr. *kosmos*, the universe; *gonè*, generation) is the (so-called) science of the formation of the universe. It is thus distinguished from cosmography, which is the science of the parts of the universe as we behold it (a science embodied in the work of Humboldt, entitled *Cosmos*), and from cosmology, which reasons on the actual and permanent state of the world as it is. Geogony, which confines itself to the formation of the earth, and speculative geology, are but subdivisions of cosmogony.

Cosmogonists proper may be divided into two classes—the theistical, and the pantheistical. According to theistic C., the world of matter and order sprang at once into existence at the Omnific fiat. The chief speculations from this point of view, have of late been regarding the *date*, if the expression may be used, of the world's formation, and, looking to the facts of geology and astronomy, the precise condition of the cosmos when evoked; how much, in short, of the evolution, since the date, is attributable to the operation of secondary causes. The pantheists hold the universe, on the other hand, to be the very body and being of Deity, and as such to have been from all eternity. God is all things, and all things are God—a conclusion reached from pure *à priori* reasoning, and that seems to exclude all further inquiry.

Men of science, in modern times, stopping short of an actual C. or genesis of the world, have pushed their inquiries into the order of development of its present state, which they, or at least some of them, aver to have taken place from the first by the divine power exercised in the manner of natural law. They assume the existence of matter; and with them there is no proper beginning of things, but an eternal round, under fixed laws of growth and decay.

In cosmogonical speculations, heat, air, atoms with rotatory motions, numbers—all in turn have had the honor of being recognized as the fountain and causes of things. Latterly, there has been a tendency to dynamical hypotheses, not only of the formation of our own rotating globe, but of our system, and of all similar systems in space. Of these, the chief is that of Laplace, founded on observation of the mutual relations of the planets, their common direction in rotation and revolution, their general conformity to one plane, etc.; taken in connection with such facts as the rings of Saturn and the fundamental unity of the asteroids. Thus arose the Nebular Theory, which at one time had a support from Sir William Herschel's observations on the *nebulæ* (q.v.); of which, however, the discoveries by Lord Rosse's telescope in a great measure deprived it. Following up this view of a formation of the globes by natural causes, there have been speculations as to the commencement and progress of organic life upon them by similar means: these are to be found in the *Philosophie Zoologique* of Lamarck; the *Vestiges of the Natural History of Creation;* and in the work of Charles Darwin on the *Origin of Species by a Principle of Natural Selection;* all of which involve great differences of view among themselves, though all meeting in one point—an assimilation of the processes of creation to the ordinary natural course of things presumed to be arranged and conducted by the Deity. The ancient view falls under three classes.

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1. That the world is eternal both in matter and form. Aristotle taught that heaven and earth, inanimate substances and living beings, had no beginning, but were the eternal effect of an eternal cause Yet he believed that that cause was a spiritual substance; that God is an intelligent spirit, incorporeal, indivisible, immovable, the mover of all things; and that the world is an emanation from him rather than a creation by him. 2. That the matter of the world is eternal, but not its form. Asserting that from nothing nothing could come, many felt compelled to maintain that the world has always existed in some form. Yet the many evident changes equally compelled them to deny that any one form was eternal. The first forms, as they said, had a succession of variable movements which became regular by chance. The Greek poets, following the old mythological views, represent the universe as coming forth from chaos and darkness, without the action of God. Some philosophers ascribed all things to an infinity of atoms or indivisible particles, having form, size, and weight, existing from eternity, moving by chance, combining into a variety of substances, and changed in the progress of time into the present organization of things. The Stoics attributed the origin of all things to two principles which they called God and matter, yet regarded them both as corporeal, as they did not admit the existence of spiritual beings. 3. The third theory ascribes the origin of the world to a great spiritual creator. There are traces of it among the Etruscans, Magi, Druids, and Brahmans, who probably derived it by tradition from a primitive revelation. It was, to some extent, received among the Greeks and Romans. It is especially the doctrine of the Scriptures, which teach it with the supreme design of exhibiting the wisdom and power of God rather than of setting forth, with what we call scientific exactness, the modes and processes by which the worlds were formed. They employ common language as that which the most scientific and the most uncultured alike understand and use. And although their main design is not to teach physical science, yet, considered as the word of God, whenever they do speak concerning his works, they must speak the truth. That the harmony between the word and the works may appear, it is necessary that both should be fully understood. If either or both be incorrectly interpreted, contradictions necessarily appear. In the past, the interpretations of both have been either absolutely false or only imperfectly true. But as biblical and physical science, each in its own line, advance towards perfection, the harmony between them is seen to be great and wonderful.

The account at the opening of the Bible, as at present understood, sets forth the following points. 1. That the matter of the world had its origin "in the beginning" by the action of God. The word *bara*, translated "create," is used three times in the narrative, at its great transition points, with reference to the original *matter*, of *animal life*, and of man endowed with *spiritual life;* in all other instances, where processes of formation only are implied, another word, *asah*, translated "made," is used; and at the close both are joined together: "God *created to make.*" 2. Matter in its primitive state is said to have been "without form and void;" both words have substantially the same meaning—*empty*, and by the repetition signify *very empty;* thus they supply the fit description of gaseous matter. 3. It is said that darkness prevailed unbroken. 4. That motion was imparted to the mass. The root of the word *te-hōm* signifies, revolving or circular motion, and the form of it denotes that to which such motion has been imparted. 5. The action of God's power on the mass. 6. Light diffused through the mass as one of the first results of motion. 7. Separation of light from darkness. Light, wherever existing, is called "day," and darkness, wherever remaining, is called night. This marked off the *first* period. 8. The *second* period was distinguished by the formation, not of a "firmament" (as the English translation has it, from the Latin *firmamentum*, and that from the Greek στερεωμα, all describing the heaven as a solid sphere), but of *an expanse*, as Moses says, giving a good expression for the atmosphere expanded around the world. The great idea of the second period's work is division or separation. This follows from motion as certainly as light. "The vast primitive nebula of the first period breaks up into masses, and these are concentrated into stars." 9. To the *third* period two works are assigned: (a) The formation of the material globe of the earth. The main fact expressed is the condensation of matter into the solid globe and its liquid covering. The result is given without any statement of the process. (b) The introduction of vegetable life as the connecting link between inert matter and animal life. An outline of the system is given once for all at the origin of it. 10. At the *fourth* period, the sun, moon, and stars appeared as within the earth's atmosphere, to give light to the earth; to divide its day from its night; and to govern its seasons, days, and years. These were not *formed* in the fourth period, but then *appeared*, the original light of the earth having declined sufficiently to make them visible within its atmosphere. 11. The *fifth* and *sixth* periods unfold the successive creation of the various tribes of animals which people the water, the air, and the land, "in the precise order indicated by geology." In the *fifth* the water-animals were created, marine monsters and birds; the *sixth* (the third period in the era of life) was distinguished (as the third in the era of matter had been) by two works: (a) the formation of the higher animals that live on the land, and (b) the creation of man. For the former, the word employed is "God *made.*" The word "create" having been used to describe the beginning of animal life, all the modifications of it are described only as "made." But the second work of the sixth period was the introduction of a higher order of life, consequently it is said, God "*created*" man in his image.

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12. The creative and formative works of the six periods are followed by the seventh, the period of God's resting from them both. That this is still in progress is indicated in the *record* by no evening being assigned to it, as had been to all of the six, and in the *universe* by its being simply upheld in existence without the creation of any new worlds or new orders of creatures. And as the Scriptures, at the beginning, declare the fact of God's resting from the work of formation, so, at the close, they announce that the work is to be resumed. He that sitteth on the throne said—"Behold, I make all things new." These six periods of work the account calls "days." For a long time it was assumed, without reflection, that they were only 24 hours long. Consequently when, by examination of the rocks and strata of the earth, scientific inquirers were brought to believe that its formation had been continued through a very long period, there was an apparent and startling contradiction between the new science and the Bible. But the account in Genesis nowhere limits the length of the periods. It uses the Hebrew word *yōm* (to which the English word "day" corresponds) in six different applications. 1. As meaning *light*, in opposition to darkness or night, without reference to duration. 2. The day of 24 hours—the period of the rotation of the earth, indicated by the apparent rising and setting of the sun and stars. 3. The illuminated portion of these 24 hours, as distinguished from the dark, making the earth's day and night. 4. The cosmogonic day, the length of which is the question to be determined. 5. The sum of the whole six of these periods—"in the day that the Lord God made the heavens and the earth." 6. The seventh day, without being yet ended, has already been as long as the whole number of years since the earth and heaven were made ready for man—that is, according to the lowest computation, nearly 6,000 solar years. Moreover, the account does not determine how long the interval was between "the beginning" and the origin of light, or that between the successive periods of work. If, therefore, the strata of the earth certainly show that they have been formed during a very long period of time, what is there in the Mosaic account that is inconsistent with them? See Peck, *Semitic Theory of Creation* (1885).

COSMORAMA (Gk., *kosmos*, the world, (*h*)*orama*, a sight, spectacle), an exhibition through a lens or lenses of scenes in various parts of the world, landscapes, cities, or buildings, with mechanical arrangements to make the scenes appear as natural as possible, and so produce the effect of actual vision of the objects or places exhibited.

COSMOS. See Cosmogony.

COSSACKS (Russ. *Kasak*), a race whose origin is hardly less disputed than that of their name. The latter has been variously derived from words meaning, in radically distinct languages, "an armed man, a saber, a rover, a goat, a promontory, a coat, a cassock, and a district in Circassia." The C. are by some held to be Tartars, by more to be of nearly pure Russian stock. The most probable view is that they are a people of very mixed origin. Slavonic settlers seem to have mingled with Tartar and Circassian tribes in the regions to the s. of Poland and Muscovy, in the Ukraine and on the lower Don; and to have given to the new race, first heard of as Cossacks in the 10th c., a predominantly Russian character. On the conquest of Red Russia by Poland, numerous Russian refugees fled to the Cossack country; and more on the Tartar conquest of Muscovy. The numbers of the C. were also recruited from time to time by adventurers or fugitives from Poland, Hungary, Wallachia, and elsewhere; but in physique, as in language and religion, the C. have always been mainly Russian. They distinguished themselves in war against Turks and Tartars, and were known as a powerful military confederacy in the 15th century. The kings of Poland and the czars of Muscovy employed them largely to defend their frontiers, especially against nomadic neighbors; but the connection between the C. and their lords paramount was always very elastic, and was frequently repudiated to suit the convenience of either party. The C. are still the outposts of Russian authority towards Siberia, Central Asia, and the Caucasus. Living near, or as "free Cossacks" amongst, hostile peoples, the C. developed their peculiar military organization—either forming a cordon of military settlements along the confines of occupied territory, or as isolated camps in the nomad country beyond. Agriculture they eschewed; self-reliance and readiness at all times for defense or assault were their chief characteristics; though such of them as inhabited the banks of the Don and Dnieper, and their islands, became and still are skillful boatmen and fishers. Their political constitution was completely democratical; all offices were elective for one year only; and every Cossack might be chosen to any post, including the supreme one of Attaman or Hetman. This organization they have in great measure retained, though the office of Hetman was abolished by the emperor Nicholas, except as a title hereditary in the imperial family. There have been two main branches of the C.—the Malo-Russian and the Don Cossacks. To the first belonged the Zaporogian C., those dwelling near the *Porogi* or falls of the Dnieper. From them again are descended the Tschernomerian C., those of the Kuban valley and of Azov. From the Don C. spring those of the Volga or of Astrakhan, of the Terek valley, of Orenburg, of the Ural, and of Siberia. They furnish a large and valuable contingent of light cavalry to the Russian army, and are very patient of fatigue, hunger, thirst, and cold. The Don C. give name to a province with an area of nearly 60,000 sq.m., and a population of over a million inhabitants (of whom 20,000 are

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Kalmucks). Though the C. have generally been represented in the w. of Europe as little better than fierce savages, they have left a very favorable impression on those who have dwelt among them Jonas Hanway found them in 1743 "a civilized, and a very gallant as well as sober people;" and many more recent travelers agree in asserting that the C. are in intelligence, cleanliness, refinement, and enterprise greatly the superiors of the average Russians. See Springer, *Die Kosacken* (1877), Wallace Mackenzie's *Russia* (1877), and an article in the *Geographical Magazine* for 1878.

COSSIMBAZAR' (*Cossim's market*), stands on the Bhagirathi, which is the first or most westerly offset of the Ganges, and is the river port of Moorshedabad. It was once famous for its silk manufactures. Pop. about 4,000.

COS'SUS. See GOAT MOTH.

COSTA, ISAAC DA, an eminent poet and religious writer, was b. at Amsterdam, Jan. 14, 1798. His parents were Portuguese Jews, who had settled in Holland. The first aspiration of his poetical genius having been shown by his Hebrew teacher to Bilderdijk, the latter expressed himself favorably regarding it, and a warm and lasting friendship sprang up between him and Costa. In his twentieth year, C. acquired the degree of doctor at law; and shortly after, having embraced Christianity, was baptized. This subjected him to considerable persecution, which, however, subsided as his genius gradually gained recognition. The most interesting of his writings to the British public are probably his translation of Byron's *Cain;* his *Israel and the Gentiles;* and *Harmony of the Gospels,* the last two of which have been translated into English. As a public lecturer, C. specially excelled. His *Battle of Nieuwpoort,* the last of his poems, is one of his masterpieces. He died April 28, 1860.

COSTA, Sir MICHAEL, a very popular musician and composer, was b. at Naples, Feb., 1810. As he early showed a decided talent for music, he was sent to the conservatoire in his native city for education, where he greatly distinguished himself. In 1828, his fame, though he was then but 18, having reached England, he was invited to take part in the Birmingham musical festival, an invitation he complied with; and he was so well received in this country that he resolved to settle in it. In 1830, he was appointed conductor of the music in the Italian opera, London, an office which, in 1847, he resigned for a similar one in the royal Italian opera, Covent Garden. His great work, the oratorio *Eli,* produced at the Birmingham festival of 1855, raised him to a high rank as a composer. *Naaman,* first sung in Birmingham in 1864, was a great success. He was knighted by queen Victoria in 1869; and, in the same year, received the royal order of Frederick from the king of Würtemberg, in token of his majesty's admiration of *Eli,* performed under the composer's direction at Stuttgart the previous November. C. is the author of several ballets, and of some operas, the most successful of which was *Don Carlos.* He d. 1884.

COSTA-CABRAL', ANTONIO BERNARDO DA, Count de Thomar, b. 1803; a Portuguese statesman, educated at Coimbra; judge of the supreme court in Oporto and in Lisbon; a representative in 1835, and prime minister in 1838, and again in 1841. In the next year he fomented insurrection in Oporto, assumed control of the army, established a censorship of the public schools, suppressed the universities, and so oppressed the people with taxes that he was driven from power in 1846. In 1849, he was once more appointed prime minister, and again played the dictator; but was compelled to resign. The queen refused to accept his resignation, and a revolution was started against him, which overthrew his administration in April, 1851. He fled to England, but returned the next year, and became a member of the council of state. From 1859 to 1861, he was minister to Brazil. He d. in 1889.

COSTA RICA, "the rich coast," owes its name entirely to the anticipations of its first explorers. It is the most southerly of the Central American republics, and extends from 8° to 11° 16′ north latitude, and from 81° 40′ to 85° 45′ west longitude. It comprises the provinces of San José, Cartago, Heredia, Alajuela, and Guanacaste, and the comarcas of Limon and Punta Arenas, with an area of 23,000 square miles.

History.—Costa Rica was one of the earliest discovered parts of America; Columbus touched its shores on his third voyage. In 1821, when all the provinces which formed the kingdom of Guatemala declared their independence of Spain, two parties—one desiring union with Mexico under the dynasty of Iturbide, the other seeking to form a separate republic—divided opinions in the revolted provinces. In Costa Rica, the town of Cartago chose the former, and San José the latter. The opposing factions met, and the republicans were victorious, whereupon the seat of government was transferred from Cartago to San José. In 1824, Costa Rica joined the Central American confederation; but that union was dissolved in 1839. In 1856, fearing for her own safety, the republic declared war against the filibuster William Walker, who had taken possession of Nicaragua. The Costa Rican forces, led by the president, Don Juan Mora, met Walker's troops under Col. Schlesinger near Santa Rosa, routed them, followed them into Nicaragua, and, in conjunction with the forces of the other states, surrounded Walker in the city of Rivas, forcing his surrender to the commander of the United States sloop *St. Mary's,* under whose protection he left the country. On the 17th of Feb., 1872, the ministers plenipotentiary of Costa Rica, Guatemala, Honduras, and San Salvador formed another Central American union, consisting of the independent republics named. The

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main objects of this union are to preserve the autonomy and integrity of Central American territory, to maintain the peace of the several states, to insure to each a republican form of government, to guarantee to every citizen full political liberty, and to promote progress — moral, intellectual, and material. Slavery was denounced, confiscation abolished, and the extradition of political offenders prohibited. The constitution, adopted in 1871, is the ninth since the declaration of independence, and for most of the time between 1871 and 1882 it was practically inoperative.

Topography, Products, Industries, etc. — The interior of the country is mountainous, the ranges attaining a height of over 11,000 feet, and abounding in volcanoes. The great majority of the population live in the highlands on the slopes of th mountains. From the mountains the land descends to the Atlantic in wooded slopes, and to the Pacific in broad savannahs. The climate is temperate in the uplands, and the mean temperature on the coast up to 3000 feet altitude is 79° F. The rainy season on the Pacific slope usually begins in April and ends in November.

Costa Rica is exceedingly fertile, its forests being filled with an immense variety of timber and useful dye-woods, such as mahogany, ebony, india-rubber, Brazil wood, and oak. Nearly all the fruits of the tropical and temperate zones thrive well, and flowering plants are in great profusion. Coffee, rice, maize, barley, potatoes, beans, and bananas are cultivated in the interior; cocoa, vanilla, sugar-cane, tobacco, cotton, and indigo on the warmer coast lands. In the forests are the jaguar, tapir, ocelot, puma, deer, and wild pig. Birds of all kinds, including the splendid quetzal or trogon, fill the woods. Among reptiles are the alligator, the iguana, and many other lizards, the bobo, the black-snake, and the rattlesnake. Among domestic animals, oxen and mules are the most valuable. The principal industry is agriculture, the chief products being coffee and bananas. Coffee is the principal export, its value in 1895 being 11,200,283 pesos out of a total of 14,509,440 pesos, the value of the exports during the year. Other exports are bananas, hides, cedar, and various woods. The manufactures are not extensive. Sugar cane is raised and sugar manufactured to some extent. Gold, silver, and other metals have been found, but the mineral resources of the country are not developed. In 1895 the United States supplied $35\frac{13}{100}$ per cent. of the imports into C. R.; Great Britain, $28\frac{4}{10}$ per cent., and Germany, $21\frac{44}{100}$ per cent. The chief ports are Punta Arenas, on the Pacific, and Limon, on the Atlantic coast.

Costa Rica is now governed under the constitution of Dec. 22, 1871. The legislative power is vested in a congress of one chamber, chosen in electoral assemblies, the members of which are returned by universal suffrage. The congressmen are elected for four years, one-half retiring every two years. The executive authority is in the hands of a president, elected in the same manner as the congress, for four-year terms. He is assisted by two vice-presi lents, elected annually by the congress. There have been constant changes by revolutions and wars, so that many of the presidents have not served their full terms. The administration is carried on by the ministers of the interior; of foreign affairs, instruction, and worship; of finance and commerce; and of war and marine. There are steamship lines plying between Limon and New York, New Orleans, and various European ports. Punta Arenas is connected by steamship with Panama, Central American, and Mexican ports, and with San Francisco, Cal. There is a railway line from Limon to Alajuela, 147 miles in length, and another line from Punta Arenas into the interior. Further lines are projected, congress having authorized the executive to make the necessary surveys and estimates. On March 31, 1896, the internal debt of C. R. amounted to 1,381,591 pesos. The government ran into arrears in the payment of its foreign debt, and in 1895 went into default. The bank of C. R. has had the monopoly of the note issue, and in 1895 the paper circulation was 3,107,000 pesos, with a specie reserve of 1,155,000.

Religion and Education.—The established religion is the Roman Catholic, but there is entire religious liberty under the constitution. Education is compulsory and free. There are numerous primary schools and several establishments for higher education.

Population.— According to the census of Feb. 18, 1892, the population was 243,205, of whom 6,289 were foreigners. In that year the greatest number of foreigners were from Spain. The population of European descent is largely of pure Spanish blood. The capital is the city of San José, population 20,000.

COSTE, JEAN JACQUES, MARIE CYPRIEN VICTOR, b. 1807; a French naturalist noted for researches in embryology, and for efforts toward the cultivation of fishes in his country. Mainly through Coste's influence, 600,000 salmon and trout were placed in the Rhone within two years. In 1862, he was appointed inspector-general of the river and coast fisheries. He had long been a member of the academy, and had published dissertations on pisciculture and embryology. He d. 1873.

COSTEL'LO, LOUISA STUART, a voluminous English authoress, was b. in 1799. Her first production, at least of any note, was *Specimens of the Early Poetry of France* (1835), but it was as a tourist she gained the greatest popularity. The works in which she describes her traveling trips are *A Summer amongst the Bocages and the Vines* (1840); *A Pilgrimage to Auvergne*, etc. (1842); *Béarn and the Pyrenees* (1844); *The Falls, Lakes and Mountains of North Wales* (1845); and *A Tour to and from Venice by the Vaudois and the Tyrol* (1846). Miss C. also wrote several novels, the principal of which are *The Queen-Mother* (1841), and *Jacques Cœur, the French Argonaut* (1848). In 1853, she published a work of a professedly historical character, entitled *Memoirs of Mary, the Young Duchess of Burgundy;* and in 1855, another of the same kind, *Anne of Brittany*. Miss C. wrote in a very pleasant and picturesque style. She died in 1870.

COSTER, LAURENS JANSZOON, according to the Dutch, the inventor of printing, was

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b. at Haarlem, about the year 1370. The time of the invention ascribed to him must have fallen between the years 1420 and 1426. C., at first for his own amusement and the instruction of his grandchildren, cut letters out of the bark of the beech-tree, which he inverted, and employed to print short sentences. Afterwards, he discovered a more glutinous kind of ink, which did not spread in using, and succeeded in printing with it entire pages, with cuts and characters. He also replaced his wooden types by types cast out of metal, at first using lead for this purpose, but afterwards pewter, which he found harder and more suitable. C., for a time, worked in secret, because, he being a sacristan, his art, if known, would have brought him into unpleasant collision with the manuscript-writing clergy, whose productions he tried to imitate, even to the abbreviations; thus his name did not appear on the productions of his press. As custom increased, C. had to take apprentices; and one of them, a German, Johann, making use of the confusion occasioned by C.'s death in 1439, is said have purloined the greater part of his master's types and matrices, and to have fled to Mainz, where he brought the hidden art to light. This Johann was probably Johann Gänsfleisch, a member of the Gutenberg family. Such, at least, is the history of the invention of printing as given by the Dutch, and which they support by the testimony of Hadrianus Junius, the historian of the states of Holland, who, in his account of the discovery, states that, at the time he wrote, C.'s descendants were in possession of drinking-cups made out of the remains of the types which C. had used. Moreover, a celebrated printer of Cologne, Ulrich Zell, deceased about the year 1500, is said to have declared "that Gutenberg, *his master*, had derived his art from Holland, after the model of a *Donatus* printed there." Now, a Donatus of C.'s time still exists; it was produced in 1740, by Johannes Enschedé, also a celebrated printer of Haarlem; and no sooner had his discovery been made known in Meerman's *Origines Typographicæ*, than fragments of the same work appeared in such quantities, that no one could any more aver that this early monument of imperfect typography, mostly printed from indisputably Dutch types, had been struck off from Gutenberg's press. Gutenberg's works, even now, are models of impression; those ascribed to C., *at first printed on one side only*, are the first proofs of a beginner. Then, all the characters of the oldest Dutch printed books resemble the Dutch handwriting of the first half of the 15th c., a proof of the independent nature of the attempts towards imitating manuscripts for sale. Other evidences are given by the Dutch that C. was the true inventor of printing; the most eminent advocates of his claims being Meerman, Koning, Scheltema, Van Westtreenen van Tiellandt, De Vries, Schinkel, Noordziek, Ebert, Leon de Laborde, Paul Lacroix, and Bernard. Yet the most thoroughgoing assault on the claims of C. and of Haarlem, as being founded on local legends, was made in 1870 by a Netherlander, A. von der Linde. In the town-house of Haarlem, the typographical remnants of the productions ascribed to C. are preserved. See PRINTING; and for the German account of the invention, GUTENBERG. As for C., his memory still is held in due honor by the town of his birth; the site of his house is still pointed out with pride; and monuments to his memory have been erected.

COSTILLA, a co. in s. central Colorado, w. of the Rocky mountains, and bordering on New Mexico, bounded on the w. by the Rio Grande del Norte; 1720 sq.m.; pop. '90, 8491, mostly Mexicans and Roman Catholics in religion, still dwelling in adobe houses. Stock-raising is the main business. Co. seat, San Luis.

COSTIVENESS. See CONSTIPATION.

COST'MARY (i.e., *cost*, or aromatic plant, of the Virgin Mary), or ALE-COST, *Balsamita vulgaris*, a perennial plant of the natural order *compositæ*, sub-order *corymbiferæ*, a native of the s. of Europe, which has long been cultivated in gardens in Britain for the agreeable fragrance of the leaves. The root-leaves are ovate, of a grayish color, on long footstalks; the stem is 2 to 3 ft. high; the stem-leaves have no footstalk; the small heads of flowers are in loose corymbs, deep yellow.

COSTRO'MA. See KOSTROMA.

COSTS, the technical name in English law for the expenses incurred in legal proceedings. As a general rule, the C. of the successful party are paid by the loser, but the rule is subject to important exceptions. 1. A party suing or defending *in formâ pauperis* (to entitle him to which privilege he must swear that he is not worth £5), does not pay C., though he is entitled to receive them if successful. 2. In actions in which the plaintiff recovers damages under 40*s.*, he is, in certain cases, not entitled to C., unless the presiding judge certifies that he ought to have them; and in all other cases, he is not entitled to them, if the presiding judge certifies that he ought not to have them. 3. A plaintiff who might have brought his action in the county court, is not entitled to C. if he sues in the higher courts, and recovers not more than £5 in certain actions, or £20 in others, unless the judge who tries the case certifies that it was proper the action should have been brought in the higher court. 4. A party who is successful in the main, and therefore entitled to the "general costs," may be unsuccessful upon some minor point, and therefore bound to pay the C. which belong properly to it. 5. A party who has tendered the amount recovered, and who pays the sum into court, and pleads the tender, is not bound to pay costs. 6. The payment of money into court in the course of an action relieves the party paying from C. of subsequent proceedings, if no greater amount be ultimately recovered.

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Costumes (European).—1, 2. Students' dress (about 1500). 3. People of the upper-classes (1550). 6. Costume of 1560. 7, 8. German burgher and wife (1570). 9. Spanish not 14. Russian (latter half of 16th century).

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about 1510). 4. Participants in a wedding-procession (1530). 5. Bride and bridegroom leman (1580). 10. French lady (1590). 11. Italian (1590) 12. Hungarians. 13. Turk.

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C. are taxed (i.e., the items allowed or disallowed) by the officer of the court appointed for the purpose under the name of the master. When so ascertained, they are, if in favor of the plaintiff, included in the amount for which judgment is given, if it be in his favor, and recovered as part of it. If they are in favor of the defendant, they are recovered as a judgment in his favor; and any party may have, if he chooses, his own attorney's or solicitor's bill taxed by the same officer before paying it, or even after payment in certain cases.

In criminal cases, the prosecutor's C. may be allowed by the judge, and in that case are paid out of the county rates, the county being reimbursed by the treasury.

In chancery suits, C. are, in the discretion of the court, given as a general rule to the successful party; but when the suit was properly instituted, and was of the nature of an administrative suit, C. are often given out of the estate.

C., in Scotland, are called expenses (q.v.). See also AUDITOR OF THE COURT OF SESSION.

Costs in the legal practice in the United States, are very much as in England, nearly all the states of the union having adopted substantially the statute of Gloucester, 6 Edw. I. c. 1. Statutes which give costs are not to be extended beyond the letter, but must be strictly construed. They do not extend to the government, and therefore when the United States is a party they neither pay nor receive costs unless by express provision of a statute. In equity, the giving of costs is entirely discretionary, as well with respect to the period at which the court decides upon them, as with respect to the parties to whom they are given. In the exercise of their discretion, courts of equity are generally governed by certain fixed principles. See also EXPENSES.

COSTS in a Lawsuit. See EXPENSES.

COSTUME (Ital. *costume;* Fr. *coustume, coûtume,* from Lat. *consuetudo,* use and wont) is another form of the word custom, and, in its wider sense, signifies the external appearance which the life of a people presents at a particular epoch of its history. In its narrower and more usual sense, C. signified the customary modes of clothing and adorning the person, in any particular age or country. In this sense, it includes the prevailing fashion in jewelry, weapons, and other personal equipments. In both senses, C. plays an important part in art. The poet, more especially the narrative or epic poet, is compelled to resort to it as a means of carrying his reader back into the age which he describes. Homer has it constantly in view in narrating the exploits of his heroes. Amongst modern romance writers, sir Walter Scott has introduced the fashion of perhaps an excessive attention to mere external costume. But it is in art as presented to the eye, that C. becomes indispensable, and the loose and general treatment of it which is permitted to the novelist or the poet, is forbidden to the painter, the sculptor, and the player. How sorely the sculptor has been tried by the wigs and breeches of former generations, and by the trousers, straps, hats, and other monstrosities of our own, no one who has seen a statue of Frederick the great, or of the late sir Robert Peel, can require to be told. Two means, not of solving but of escaping from the difficulty, have been largely resorted to: the one consists in departing from the modern dress altogether, and reverting to the ancient toga; the other, in wrapping up the figure, as far as possible, in a cloak. The first of these devices is neither more nor less than a deliberate violation of what artists regard as the laws of C., by which they conceive themselves bound to represent every object with its appropriate accessories; the second, besides being very often open in a lesser degree to the same objection, has the further disadvantage of accomplishing its object very imperfectly. The wisest course for the artist is boldly to face the difficulty. That he may do so successfully, many of the works of Rauch, Tieck, Thorwaldsen, Schadow, and others abundantly testify. In the earlier stages of art, an excessive attention to C. may generally be remarked, which though useless, and sometimes hurtful to artistic effect, has proved of the greatest value for historical purposes. The tendency of the earlier schools of art to exhibit C. with an almost painful accuracy and minuteness, is exhibited in the works of the older masters, both of the Italian and German schools. Even during the period of the highest bloom of Italian art, the mediæval custom of representing historical, sacred, and ideal characters in the C. peculiar to the time and country of the artist, was in a great measure adhered to. From Paul Veronese, Tintoretto, and others, we may learn the aspect which a marriage-feast in the palace of a Venetian or Florentine grandee presented, but can form little conception of the C. of that simpler festivity in Cana of Galilee, or of that supper still less sensuous in Jerusalem, which they profess to represent. In the hands of the greater masters, these scenes assume an ideal character; and in the works of Michael Angelo, Leonardo, and Raphael, C., though still exhibiting something of a native trace, rises into the highest regions of poetical conception. The effort to avoid anachronisms by a previous historical and antiquarian study of the subject, belongs, indeed, almost entirely to the modern European schools of art, and many painters of late have devoted themselves to it to such an extent as almost to forget that it is a means, and not an end, except, indeed, to a mere painter of clothes.

But it is in theatrical representations that attention to C., particularly in its narrower sense, becomes most imperative. When the stage, in western Europe, commenced in the religious mysteries of the middle ages, the dress adopted was that which belonged to the time and the country. To this dress some fantastical object was generally added

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to indicate the character intended to be personated. In this position matters remained during the time of Shakespeare in England, of Lope de Vega and Calderon in Spain, and even of Corneille, Racine, and Molière in France. Whether a Greek, a Roman, an Assyrian, or a Turk, was represented, the ordinary court-dress of the time was adhered to, and the turban, the helmet, or the laurel-crown was placed on the top of the peruke or the powdered hair. In like manner, shepherdesses and peasant-girls had their hair dressed in turrets like feudal keeps, and long white kid-gloves which covered their hands and arms to the elbow. Towards the middle of the 18th c., a reform was introduced by the famous actress Clairon, who acted Electra without hair-powder; but Talma was the first who introduced a C. really true to history. Garrick followed in the footsteps of the great Frenchman, though both he and Siddons, during their earlier period, personated the characters of Shakespeare in what has been called the rococo C.—knee-breeches and periwigs. Schlegel's *Hermann*, and Goethe's *Götz von Berlichingen*, were the first plays which were given in Germany with historical costume. See FASHION.

COS'TUS, or COSTUS ARAB'ICUS, an aromatic much esteemed by the ancients, and concerning which great doubt long existed, but which seems now to be ascertained to be the dried root of *Aucklandia costus*, a plant of the natural order *compositæ*, sub order *cynarocephalæ*. It is a native of the moist open slopes surrounding the valley of Cashmere. The roots are there burned as incense. They have a strong aromatic pungent odor, and are employed in protecting bales of shawls from moths.

COS'WAY, RICHARD, a very noted painter in his day, was b. at Tiverton, Devonshire, in 1740. He early displayed a taste for painting, and between his 14th and 24th year carried off five premiums from the society of arts. As a miniature-painter, he was particularly famous, and gained all the patronage of the nobility of his time. His works, in fact, were the fashion, and all attempts at rivalry were useless. Many of them were distinguished by great delicacy, correctness, and beauty, and his drawings were not unworthy of a place beside some of the old masters. The immense sums of money which he made enabled him to live in the most sumptuous style, and to give musical parties (his wife, on such occasions, being the principal performer), so far surpassing all other efforts of the kind that they formed a feature of the time, and were attended by all the rank, fashion, and intellect of that day. C. died in 1821.

COT, on shipboard, is an officer's hammock. It is made of canvas, in the form of a kind of chest, 6 ft. long, 2¼ wide, and 1 deep. This receptacle is kept out at full length by means of a square wooden frame. The bed or mattress is placed within the C.; and the arrangement is more comfortable than that of a sailor's hammock; but both are alike slung from the rafters or beams of the cabin.

COT, PIERRE AUGUSTE, 1838–83; b. Bédarieux, France; pupil of Cogniet, Cabanel, and Bouguereau. He painted many pictures of great merit, among others, "Spring Time," "Day of the Dead at the Campo Santo of Pisa," "Dionisia," "Prometheus," and "Meditation." He was decorated with the cross of the Legion of Honor.

CÔTE-D'OR, a department in the e. of France, formed of part of the old province of Burgundy, in lat. 46° 55′ to 48° 10′ n., long. 4° 2′ to 5° 30′ east. It has an area of 3,383 sq. m., with a pop. in 1896 of 368,168. The surface is in general rather elevated, and is traversed by a chain of hills forming the connecting link between the Cevennes and the Vosges. A portion of that range, called the Côte-d'Or ("golden slope"), receives its name (which it gives to the department) on account of the excellence of the wines produced on its declivities. See BURGUNDY WINES. A great part of the department is covered with forests. The valleys and plains are fertile, and there is good pasture-land; but agriculture is in a backward state. Côte-d'Or is watered by the Seine, which rises in the n.w., and by several of its affluents; by the Saone and by the Arroux, a tributary of the Loire. By means of canals, Côte-d'Or has water communication with the German ocean, Mediterranean, English channel, and bay of Biscay.

COTES, ROGER, a scientific man of much promise, was b. at Burbage, near Leicester, July 10, 1682; but death cut him off on the high-road to fame ere he had attained his 34th year; not, however, before he had left some marks of his presence in the history of exact science. He was the author of the admirable preface explaining the Newtonian philosophy, and answering objections to gravitation, which was prefixed to the second edition (1713) of Newton's *Principia*. Various mathematical papers of his own, tending greatly to the development of logarithms, were published after his death. Short as his life was, his influence on mathematics is clearly traceable. He was held in the highest esteem by the scholars and scientific men of his time; and sir Isaac Newton is asserted to have said of him that, had he lived, "we should have known something."

CÔTES-DU-NORD (northern coasts), a department in the n.w. of France, formerly a part of Brittany, and bounded n. by the English channel, in which are several small islands belonging to Côtes-du-Nord; lat. 48° 3′ to 48° 57′ n., long. 1° 53′ to 3° 35′ w.; area, 2,659 sq. m.; pop. '96, 616,074. The Armoric hills, called also the Montagnes Noires, and the Menez mountains, cross the department from e. to west. They have a breadth of about 16 m., and consist chiefly of granite and clay-slate. These formations give a rude and broken aspect to the coasts. The chief rivers, which are short but navigable, are the Rance, Gouet, Trieux, Guer, and Arguenon. The southern district has the advantage of a considerable length of the canal between Nantes and Brest. Though a great por-

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tion of the s. and the higher plains is occupied by heaths and woods, there are, here and there, fertile spots; and in the n. the influence of the neighboring sea is favorable to vegetation. The cultivation of flax and hemp, with pasturage and iron-mining, supply employment in the mountainous districts; while in the sheltered valleys and on the coast-levels all European kinds of grain, with pears and apples and other fruits, are produced; and maize is cultivated, but does not always ripen. The coasts are well supplied with various kinds of fish. The department is divided into the five arrondissements of St. Brieuc, Dinan, Loudéac, Lannion, and Guingamp. The chief town is St. Brieuc.

COTES'WOLD, or COTSWOLD HILLS, a range of oolitic and lias hills, running through the middle of Gloucestershire, from Chipping Camden in the n.e., by Cheltenham and Stroud, to near Bath in the s.w. They are parallel to the Avon and Severn, and separate the lower Severn from the sources of the Thames. They are 54 m. long, and in some parts 8 broad, and cover 312 sq.m., with an average height of 500 to 600 feet. The highest points are Cleave hill, 1134 ft., and Broadway hill, 1086 feet. The soil is a clayey loam, with gravel and stone-brash. The surface is generally bare, with little wood; corn, turnips, and sainfoin are grown, and coarse-wooled sheep fed on them. At Stroud, they are crossed by the Thames and Severn canal, and the Swindon Junction railway.

CÖTHEN, or KÖTHEN, an ancient t. of Germany, in the duchy of Anhalt, 22 m. s.w. of Dessau, and about 82 s.w. of Berlin, on a tributary of the Saale, and at the junction of railways from Berlin, Magdeburg, Bernburg, and Leipzig. The streets are broad, the town is neat and well built, is surrounded by high walls, and is divided into the old and new town. It contains a castle with three towers, several churches and schools, a synagogue, a library, a handsome railway station containing a gaming-house, and various charitable institutions. Sugar from beet-root is largely manufactured here. Pop. '90, 18,215.

COTHUR'NUS. See BUSKIN.

COTICE, or COST, in heraldry, one of the diminutives of the bend (q.v.).

CO-TIDAL LINES, a system of lines on a globe or chart which show the movement of the ocean tidal waves. The lines mark the places of high water at the same moment.

COTIL'LON (Fr. under-petticoat), the name of a brisk dance, of French origin, performed by eight persons. The quadrille, which superseded it, is only a new variety of the cotillon.

COTINGA, *Ampelis*, a genus of birds of the family *ampelidæ*, or chatterers (q.v.), having a rather feeble and deeply cleft bill, and feeding both on insects and fruits. They are natives of South America, inhabit moist places, and are remarkable for the splendor of the plumage of the males during the breeding-season. Azure and purple are then their prevalent colors. During the rest of the year, they are clothed in a tame gray or brown.

COTONEASTER, a genus of plants of the natural order *rosaceæ*, suborder *pomaceæ*, having polygamous flowers; a top-shaped calyx, with five short teeth; five small, erect petals; erect, short stamens; and a top-shaped fruit, the nuts of which adhere to the inside of the calyx, but do not cohere in the center. The species are pretty numerous, shrubs or small trees; some of them evergreen; with simple undivided leaves, more or less woolly beneath; small flowers in lateral cymes; and small fruit not agreeable to the palate, but the bright color of which, and its remaining on the tree in winter, make them very ornamental. *C. vulgaris* is a deciduous species, a native of hills in Europe and Siberia, and said to be found wild in a single locality in Wales. *C. tomentosa* is also found in the Alps. Most of the species are natives of mountainous parts of Asia; they are sufficiently hardy for the climate of Britain, and have become among the most common of our ornamental shrubs. Some of them, as *C. rotundifolia* and *C. microphylla* —both from the n. of India—are much used for covering walls.

COTOPAX'I, the loftiest active volcano in the world, is in Ecuador, in the eastern chain of the Andes, and about 50 m. s. of the equator. Humboldt gave the height at 18,880 ft.; Reiss, the first to ascend it (in 1872), found it to be 19,500 ft. above the sea. The valley at its foot, however, is itself 9,000 ft. high. The upper part of C., a perfect cone of 4,400 ft., is entirely covered with snow, excepting that the immediate verge of the crater is a bare parapet of rock. Reiss estimated the crater, which is elliptical, as 1500 ft. in depth. Below the snow is a well-marked barren belt covered with lichens and shrubs, below which again is forest. Smoke issues from the summit; sounds as of explosions are occasionally heard; and above, a fiery glow is often visible by night. Lava rarely flows even during eruptions, but flame, smoke, and immense volumes of ashes are then ejected; and when the heat melts large masses of the snow lying on the sides, destructive floods are occasioned in the valleys beneath. The first eruption recorded was in 1533. Others followed in 1698, 1743, 1744, and 1768, the most terrible of all. On the latter occasion ashes were carried 130 m. distance, and thickly

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covered an extensive area. C. was quiet till 1851. In 1854, 1855, and 1856, there have again been eruptions. Whymper, 1880, gave the height as 19,614 ft.

COTRO'NÉ, a t. of Italy, in the province of Catanzaro, built on a point of land projecting into the sea, in lat. 39° 7′ n., long. 17° 10′ east. It is almost surrounded by the Esaro (ancient Æsarus), which here has its *embouchure*. C. is very strongly fortified. Its streets are dark and narrow, and its port of no importance; pop. above 8000. C., however, possesses interest from its antiquity and its historic associations. It owes its origin to a colony of Acheans, as far back as 710 B.C., its ancient name being Croton or Crotona. It soon became prosperous, wealthy, and powerful. Its walls measured 12 m. in circumference, and the territory over which it extended its sway was considerable. Its inhabitants were celebrated for athletic exercises, and they carried off most of the prizes at the Olympic games. Milo was its most renowned athlete. Pythagoras settled here about the middle of the 6th c. B.C.; but the influence which, by means of a league of his formation, he exercised, became obnoxious to the citizens, and he was expelled. About 510 B.C., C. sent forth an army of above 100,000 men to fight the Sybarites, who were utterly defeated, and their city destroyed. The war with Pyrrhus completely ruined the importance of C., and in the 2d c. B.C. it had sunk so low, that a colony of Romans had to be sent to recruit its well-nigh exhausted population. It never afterwards recovered its prosperity. Some ruins belonging to the old, exist in the vicinity of the modern city, the most important of which is a Doric column, part of a once magnificent temple to Juno, on cape Colonne or Nau (the Naus of the ancients).

COTTA, the name of a very old German publishing-house, established at Tübingen in 1649, and still one of the most flourishing in Germany. The family came from Italy about the beginning of the 15th century. Its most prominent member was Joh. Friedr., Freiherr von C., a meritorious theologian of the 18th century, 1701–79.

JOH. FRIEDR., FREIHERR VON C., grandson of the theologian, one of the most eminent publishers that Germany ever produced, was b. at Stuttgart, 27th April, 1764. He was educated at the university of Tübingen, and for some time practiced as an advocate. In 1787, he undertook to conduct the family book-trade at Tübingen; and in 1795 established the *Horen*, a literary journal, under the editorship of Schiller. In the same year he commenced two larger periodicals, the *Politischen Annalen* and the *Jahrbücher der Baukunde*. In 1798, he established the *Allgemeine Zeitung*—still published at Augsburg—the *Almanach für Damen*, and other works of a similar kind. C. now began to publish the works of the illustrious modern authors of Germany, such as Goethe, Herder, Fichte, Schelling, Jean Paul, Tieck, Voss, Therese Huber, Matthisson, the Humboldts, Joh. von Müller, and Spittler. Besides the periodicals already mentioned, C. established the *Morgenblatt* and the *Literaturblatt*, and carried on the *Kunstblatt*, founded by Schorn. In 1810, he went to live at Stuttgart. The nobility of his family, which dated far back, was confirmed in his person under the title of Freiherr C. von Cottendorf. In 1824 he introduced the first steam-press into Bavaria, and, shortly after, founded at Munich the literary and artistic institute. He died 29th Dec., 1832. C.'s political principles were liberal, but temperate. In the diet of Würtemberg, and afterwards as president of the second chamber, he was always the fearless defender of constitutional rights. In manners, C. was simple and pure; and although covered with titles and orders from different governments, he had neither the pride nor the selfishness of an hereditary patrician. The first Würtemberg proprietor who abolished servitude on his estates, C. also furthered the interests of his farmers by building model farms, and by setting an example in all rural improvements.

COTTAGE, a small dwelling-house, detached from other buildings, and usually of one story in height. Originally applied to a humble order of dwellings in the country, the term C. now embraces a wide variety of structures.

COTT'BUS, or KOTT'BUS, a t. of Prussia, in the province of Brandenburg, situated on the Spree, about 70 m. s.e. of Berlin. It is an ancient place, surrounded by walls, and it has an old castle with towers, a royal palace, a gymnasium, and manufactures of beer, woolens, linen, leather, and tobacco. Pop. '90, 34,909.

COTTIERS originally denoted a class of sub-tenants who rented their cottages and a few acres of land from the small farmers; but later the term applied to those farmers themselves whose rent was determined not by custom but by competition. The most notable example of this system of land tenure was Ireland, where at one time the greater portion of the agricultural population consisted of cottier-tenants. The laborer made his contract for the land without the intervention of the capitalist farmer; and so great was the deficiency of capital that the custom of paying wages in land became nearly universal. Even those who worked as casual laborers for the cottiers received instead of wages the permission to work for the season a piece of land which was delivered to them by the farmers and known as conacre. A money rent was stipulated, but the debt was paid by labor computed at a money valuation. Of late years the evils resulting from this system have been somewhat mitigated in Ireland by the decrease in her population and by the remedial legislation of Parliament. See IRISH LAND LAWS.

COTTIN, SOPHIE, a very popular French authoress, was b. at Tonneins (Lot-et-Garonne) in 1770. Her maiden name was Ristaud. Educated at Bordeaux, she was

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married when only 17 to M. Cottin, a Parisian banker, who left her a widow at the age of 20. From an early period she had exhibited a love of literature; and to cheer the solitude of her affliction (for she had no children), she now betook herself to the composition of verses, and even ventured on a lengthy history. But it was in fiction she was destined to win unfading laurels. In 1798, appeared *Claire d'Albe;* in 1800, *Malvina;* in 1802, *Amélie Mansfield;* in 1805, *Mathilde;* and in 1806, *Elisabeth, ou les Exilés de Sibérie,* a work which has been translated into most European languages, and has always been extraordinarily popular with the young. Madame C. died 25th Aug., 1807.

COTTISE OR **COST**, a diminutive of the bend (q.v.), its width being one-fourth that of the bend.

COTTLE, a co. in n. Texas, formed 1876, and organized in 1892; 900 sq. m.; mostly prairie and well watered; pop. '90, 240. Co. seat, Paducah.

COTTLE, JOSEPH, 1770–1853; a publisher and bookseller of Bristol, England, and especial friend of Southey and Coleridge, whose first poems he put before the public. He wrote poems himself, and a volume of reminiscences of the two poets named.

COTTON. An important vegetable fibre, cultivated by almost every people inhabiting those parts of the globe between the 35th parallels of latitude (this region containing the largest portion of the land surface of the globe), although its most profitable cultivation is between the 20th and 25th parallels north of the equator.

Within this belt lie the cotton districts of the U. S., Northern Mexico, Egypt, Northern Africa and Asia, except the extreme southern parts of India and the Malay Peninsula. South of the equator cotton is grown in Brazil, nearly all of which is said to be favorably adapted to its cultivation; in Australia, although not to any great extent; in Africa, where we do not know the extent of production; and in the islands of the Pacific.

Cotton is the fibre which grows under wider range of climatic conditions over a wider area, and by a greater variety and number of people, and which is useful for a greater variety of purposes than any other; while the cheapness and extent of its production preclude the demand ever exceeding the supply more than locally and temporarily.

The highest prices for 1890 for "middling upland" was 12¼ cents in New York (May 28), and 6¼*d.* in Liverpool (Sept. 6); the lowest 10¼ cents in New York (Nov. 4), and 5 9/16*d.* in Liverpool (Dec. 16).

The average net weight of bales for 1889–90 was, for American, 466 lbs.; Brazilian, 193; Egyptian, 687; Smyrna, 377; West Indian, 178; East Indian, 396.

1. *Botanical and Commercial Classifications.*—C., the produce of all the species of the genus *gossypium*, of the natural order *malvaceæ*, is allied to the mallow, hibiscus, and hollyhock, as is very apparent in both foliage and flowers. The species are partly shrubs, partly herbaceous; and either perennial or annual. While natives of tropical Asia, Africa, and America, their cultivation extends far into the temperate zones. All of them have leaves with three to five lobes, in a very young state sprinkled with black points. Their rather large flowers, mostly yellow, but sometimes partly or entirely purple, very soon fall off; they grow singly from the axils of the leaves, and are surrounded at the base by three large heart-shaped, cut or toothed, involucral leaves or bracts, partially growing together as one. The fruit, a three to five-celled capsule, springs open when ripe by three to five valves and contains numerous seeds, usually black, enveloped in C., usually white, but sometimes yellow, and which issues elastically from the boll after it has burst open. Some kinds have the flowers large in proportion, and the leaves divided into more numerous and much larger lobes; but the general appearance of all is very similar. Botanists differ as to the number of distinct species, and there are in cultivation many varieties, the number of which, through climatic and other influences, is continually increasing; but, by reason of certain peculiarities, some botanists and practical farmers reduce all cultivated kinds to four primary species: viz., (1) *Gossypium Barbadense;* (2) *G. herbaceum*, or *Indicum;* (3) *G. Peruvianum;* and (4) *G. arboreum.*

Of these, the first is the most valuable; the beautiful, silky-stapled "sea-island" wool is a variety, grown almost exclusively on the islands and a portion of the main land of Georgia, South Carolina and Florida, the salty ingredients of the soil and air being indispensable. The total crop in America for 1889–90 was but 46,803 bales. Manufacturers of thread are the principal consumers. The plant of this variety has a yellow flower, and its seeds are small, black, and quite smooth, parting readily from the fibre; but, when sown inland, away from saline influences, the seeds get larger and become covered with short hairs. A large percentage of the C. crops in Alabama, Louisiana, Mississippi, Texas, etc., are varieties of this species; but climatic influences have enlarged the seeds, shortened the fibre, and rendered the latter less readily separated. Sea-island cotton yields about 500 lbs. of seed cotton, 125 lbs. of lint cotton, per acre, its average length being 1¾ inches, extremes 1¼ to 2¼ inches. The better varieties of Egyptian C. belong to *G. Barbadense.*

G. herbaceum, found in India, China, Egypt, etc., yields such commercial varieties as Surat, Madras, and short-stapled Egyptian. It is small, shrubby, yellow-flowered; its seeds are covered with short, grayish down. Its staple is fine but not long. It can be more profitably cultivated in colder countries than any other species. A variety is pro-

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duced in the United States; and the C. known as Nankeen is thought to belong to this species.

G. Peruvianum is a native of South America, and the "green seed" variety of the U. S. seems to be a variety. The stem reaches ten to fifteen feet in height; the flowers are yellow, and the capsules contain eight to ten seeds firmly attached together in a conical mass. Its fibre is long and strong stapled, and next in value to sea island and long-stapled Egyptian. The Maranham, Bahia, and Maceio are the principal varieties.

G. arboreum, found in India, China, etc., is tree-like, bears a red flower, and produces fine, yellowish-white wool. Varieties have been long grown in the U. S., and, with requisite soil and climate, produce a fibre resembling sea island.

2. *Cultivation.*—The plant requires for its true development a peculiar soil and climate. While the method of cultivation is about the same in the various countries where it is grown, that in the U. S. is the most perfect. Although the plant is not really an annual, it pays to destroy it each year after the crop is gathered, and to sow new seeds. The land is prepared in winter. After thorough plowing, and after all frost has gone, the ground is laid off into rows from three to four feet wide, according to situation and the quality of the soil; the seed is sown along the centre of these beds, either in a straight furrow made with a small plow or opener, or in holes twelve to eighteen inches apart. The usual date to begin preparing land for the ordinary grades is from Jan. 15 in Southern Texas to March 5 in South Carolina. Sowing usually commences March 15 to April 15 and continues to May 15; but late spring frosts may delay it until May. The young shoots, which appear in from eight to ten days, are weeded and thinned in from fifteen to thirty days after their appearance, when they have attained a height of two to six inches, say, when the third or first true leaf appears. The average date of bloom is June 5. As a general rule, C. is a dry-weather plant, heavy rainfall interfering with both the culture and the stand; although an extremely dry spring interferes with the growth. For plowing it is best to have just enough rain to make the soil moist and spongy. When young, the crop flourishes best with warm steamy weather, with an occasional shower until blooming. An excess of rain produces weeds and wood; severe drought stunts the plant, matures it too early, and causes a small, light-stapled crop. Early frost causes the plant to turn brown; cold nights cause many of the plants to die. Lands in hilly or upland districts require more moisture than those lying in the plains and river bottoms. Overflowing often causes injury on bottom and flat prairie lands, but replanting and recuperation often redeem the most hopeless cases. Where, however, overflowing causes "sanding," the land is rendered utterly useless for cotton culture that year. From the date of bloom, warm, dry weather is needful, until picking time, which usually commences from August 1 in Southern Texas up to Sept. 10 in Tennessee, and continues until frost puts a stop to further growth—say, Jan. 15 for Arkansas and Texas, and Dec. 1 for Georgia, as extremes. During the harvest all the valuable hands are called into full employment. The C. is gathered into baskets or bags hung from the shoulders of the pickers, and when the crop has been secured it is spread out, dried, and then the fibre separated from the seeds. For long staple or sea-island cotton in South Carolina (where it is rather better than that in Georgia and Florida), the usual date to begin preparing land is Feb. 1 · planting begins Apr. 1 and ends May 1; picking is from Aug. 25 to Dec. 10.

3. *Separation.*—Formerly separation was done by hand, one person producing only a pound of fibre per day; but the process has been rapid and effectual since Eli Whitney's invention (in 1793) of the saw-ginning machine, which has a hopper with one side formed of strong parallel rods or wires so close together as to prevent the passage of the seeds from within, although permitting the fibre to be dragged through by circular saws attached to a large roller, and which project between the wires. This process, although injuring some of the fibre, cleans so much more than any other way, that its use is highly economical in working with the short-stapled variety, in which the wool clings closely to the seeds. The long-stapled kinds, such as sea-island, are cleaned by the roller gin, in which the fibre-covered seeds are passing between two small rollers which revolve in opposite directions, and which easily throw off the hard, smooth seeds. Its capacity is about one-fifth that of the saw gin; but it does not injure the staple. Both machines are used in Egypt and Brazil, the introduction of improved kinds having greatly increased the production of C. in these countries during the last eighteen or twenty years.

4. *Production and Distribution.*—The oldest-known cotton-producing country is India, in which the plant has been grown and its fibre manufactured from time immemorial. The early annals of Egypt make mention of it, and it is believed to have a high antiquity in all parts of Africa. Columbus found it in the western world, although not so extensively cultivated as in the East; but during the past fifty years, its culture here has distanced in quantity and in quality the produce of the old world. Down to 1800, the C. consumers of Europe depended upon the Indies and the Levant for their raw material; but by 1860, so far had the inventive genius, the superior farming, and the greater energy of the planter of our Southern States pushed the production of the fibre, that they furnished the greater part of the C. used by Great Britain and the Continent of Europe. From 1858 to 1860 America furnished 79 per cent. of the C. imported into Great Britain. During our civil war this dropped to 8¼ per cent., rising to 58 per cent. in 1871, and amounting to 80 per cent. in 1890.

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Production of the World.—This is difficult to more than approximate, as a large proportion and amount consumed is produced in uncivilized or in semi-civilized countries, where no accurate record is kept; and in many countries and districts absolutely no data are available—as in China, where soil and climate are favorable and the clothing of the population largely of cotton, yet the extent of its cultivation is a close secret; and in some parts of India, where the production can be estimated only by the amount in sight and the known or assumed requirements for dress. The amount produced in the vast unknown Continent of Africa is even more of a mystery, although native cotton forms there a large proportion of the dress; and in 1590 England imported cotton cloth woven by Guinea natives.

Ellison's estimate of 1884 gives the U. S. production as 2,814,000,000 lbs.; Brazil, Peru, Central America, West Indies, etc., 120,000,000, including 80,000,000 shipped to Europe. His estimate of the native production in India is set on the reasonable assumption of 2¼ lbs. per year per head. This on 254,000,000 people makes 635,000,000 lbs. Taking from this 364,000,000 received in yarns and goods from Great Britain and 6,000,000 from Persia, leaves 265,000,000 lbs. as the native consumption. Adding 40,000,000 lbs. of Indian yarn and goods, and the same of cotton exported to China, and 635,000,000 lbs. exported to Europe, makes the total crop 980,000,000 pounds. Assuming for China 2¼ lbs. per year per head (an amount agreeing with the Japanese Government's figures for Japan, and the import figures for Java), we have as total consumption in China 750,000,000 lbs. Taking from this 110,000,000 lbs. of yarn and goods from Great Britain and 30,000,000 from India, and 40,000,000 of raw cotton from India, and we have the total Chinese annual consumption of native cotton 570,000,000 lbs. A similar calculation for Japan, Java, Philippine Islands, Siam, etc., with 70,000,000 people, gives a total consumption of 175,000,000 lbs. Less yarn and goods from Great Britain, 102,000,000; India, 5,000,000; Holland, 15,000,000. This leaves 53,000,000 lbs. consumption of native cotton, which is almost exclusively Japanese. Turkey and Persia are estimated at 48,000,000 lbs., Asiatic Russia 40,000,000, giving 4,227,000 bales of 400 lbs. as the crop of all Asia.

Egypt is put at 250,000,000 lbs., almost all of which goes to Europe. The African consumption is put at only 1½ lb. per head per year, which on 200,000,000 people makes 250,000,000 lbs. Deducting 80,000,000 lbs. imported from Great Britain, 10,000,000 from India (partly Manchester goods re-exported), and possibly 10,000,000 from elsewhere, leaves 150,000 000 lbs. for Africa, exclusive of Egypt, or 400,000,000 lbs. for all Africa.

Adding 4,000,000 for Italy and Greece and 800,000 for Australia and Fiji, gives 502,960,000 lbs., or 12,574,000 bales of 400 lbs., as the world's production in 1884. The world's production for 1896–97 is estimated at 12,943,750 bales of 400 lbs.

The cotton acreage of India for the season of 1890 was as follows:

Presidency or Province.	Acres.
Bombay and Scinde	5,746
Berar	*2,100
Central Provinces	*650
Central India	*290
Rajputana	550
Northwest Provinces	1,584
Oudh	75
Punjaub	964
Hyderabad (Nizam's)	950
Madras	*1,500
Mysore and Coorg	*40
Assam	*25
British Burmah	*8
Bengal	*162
Total	14,644

Cotton in the U. S.—The plant was introduced in 1536, but not exported until 250 years later, the first shipment of any importance being 2000 pounds in 1770. In 1791, 189,316 pounds were exported; but Whitney's invention of the saw gin in 1793 principally raised it to 17,789,803 pounds by 1800; the production having reached 2,160,000,000 pounds in 1860, and amounting to 3,400,000,000 to 3,450,000,000 pounds in 1890.† Cheapening of the process of cultivation, and cleaning, and increase of acreage, have so lowered the cost of the fibre that while the average price in Liverpool was 1*s.* 6*d.* (say 30 cents) per pound in 1793, it was 5½*d.* (say 11¼ cents) in 1851; averaging 7*d* (14 cents) for the five years ending 1861. Our civil war causing scarcity in the production, as well as almost absolute prohibition of its export, from 1861 to 1865, raised the price in Liverpool to 2*s.* 7½*d.* (63 cents) per pound for "middling Orleans." After the war, the abolition of slavery, and the general poverty and depression of the country, lessened the amount

* Estimated. Complete returns not received.
† 7397 bales, reckoned at 466 lbs. net, each; or, say, 7653 statistical bales of 450 lbs. each.

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and increased the price of production. In 1867 there was a decline to 7⅞*d.* (14¼ cents). but in a few months it reached 1*s.* 1*d.* (26 cents). In 1890 it ranged from 5 9/16*d.* to 6¼*d.* in Liverpool; from 10¼*c.* to 12¼*c.* in New York.

The following table (or statement) gives in thousands of bales the production, distribution, and average price of American cotton, actual and proportional, for the last five seasons:

Season.	Total Crop.	Exports.			Home Consumption.	
		To Great Britain.	To Continent and Mexico.	Total Exports.	Takings of Northern Mills.	Takings of Southern Mills, and burned.
1885–86	6,575	2,565	1,771	4,336	1,781	385
1886–87	6,499	2,704	1,741	4,445	1,687	422
1887–88	7,047	2,814	1,813	4,627	1,805	459
1888–89	6,939	2,810	1,926	4,736	1,790	485
1889–90	7,297	2,854	2,052	4,906	1,780	550
1890–91	8,652	3,345	2,446	5,791	2,632	
1891–92	9,035	3,317	2,541	5,858	2,876	
1892–93	6,700	2,301	2,089	4,390	2,431	
1893–94	7,549	2,861	2,371	5,252	2,319	
1894–95	9,476	3,449	3,279	6,726	2,704	

The acreage in cotton of the ten cotton-growing states, for the season of 1896–97, was as follows:

North Carolina	1,228,714	acres.
South Carolina	2,014,348	"
Georgia	3,468,335	"
Florida	264,325	"
Alabama	2,656,333	"
Mississippi	2,835,316	"
Louisiana	1,245,399	"
Texas	6,758,656	"
Arkansas	1,542,652	"
Tennessee	912,337	"
All others	518,919	"
Total	23,445,334	"

An approximate estimate of the cotton crop in each of the United States since 1890 is given below.

States.	1889–90.	1890–91.	1891–92.	1892–93.	1893–94.	1894–95.
	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
North Carolina	336,245	588,000	518,000	388,000	447,000	465,000
South Carolina	746,798	859,000	773,000	587,000	675,000	750,000
Georgia	1,191,919	1,310,000	1,245,000	934,000	1,046,000	1,200,000
Florida	57,928	53,000	50,000	45,000	56,000	65,000
Alabama	915,414	1,011,000	1,016,000	660,000	792,000	1,000,000
Mississippi	1,154,406	1,209,000	1,330,000	851,000	1,021,000	1,200,000
Louisiana	659,583	736,000	798,000	509,000	529,000	650,000
Texas	1,470,353	1,708,000	2,032,000	1,850,000	1,966,000	3,114,000
Arkansas	691,423	760,000	825,000	574,000	632,000	875,000
Tennessee	189,072	345,000	365,000	255,000	280,000	400,000
All others	57,975	76,000	87,000	64,000	83,000	173,000
Total crop	7,471,116	8,655,000	9,039,000	6,717,000	7,527,000	9,892,000

The annual receipts at each U. S. port during the season of 1889–90, were as follows:

	Bales.
Galveston	860,000
New Orleans	1,974,000
Mobile	262,000
Savannah	957,000
Charleston, S. C.	327,000

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	Bales.
Wilmington, N. C.	135,000
Norfolk	404,000
Baltimore	92,000
New York	177,000
Boston	77,000
Philadelphia	83,000
West Point	329,000
Newport News	43,000
Minor Ports*	136,000
Total for Season	5,856,000

The dates of receipt of first bale of new cotton at the various cotton markets of the United States, for 1888, 1889, and 1890, are as under:

Point.	1888.	1889.	1890.
Charleston	Aug. 9	Aug. 17	Aug. 8.
Savannah	July 25	Aug. 5	Aug. 2.
Augusta	Aug. 2	Aug. 15	Aug. 7.
Macon	Aug. 2	Aug. 1	Aug. 7.
Mobile	July 30	Aug. 15	Aug. 9.
New Orleans†	July 29.	July 23	July 29.
New Orleans‡	Aug. 4	Aug. 23	Aug. 8.
Memphis	Aug. 11	Aug. 18	Aug. 18.
Galveston	July 25	July 24	July 8.
Houston	July 19	July 21	July 21.

Influence of Soil on Production.—The character of the soil in which the cotton plant is grown exercises a great influence upon the length, thickness, and quality of the fibre, as well as upon the amount produced per acre. In the cotton-growing states of America, there is a marked increase of the cotton culture in calcareous belts. Such soil is prevalent from the Chattahoochie river west of the Nueces river of Texas. The great pine belts of the Gulf Coast produce but very little cotton, while on the Atlantic border, with the use of fertilizers, the culture is more extended. The regions of high percentage, say 10 to 20 per cent. of area, devoted to cotton, are confined almost exclusively to the central portions of Mississippi, Alabama, and Georgia, in which the cotton acreage averages above 65 per square mile. Some counties in North Carolina, Tennessee, and Texas have the same proportion. Regions of maximum cotton culture above 20 per cent. of the total area form two permanent belts, one lying along the Mississippi river within the alluvial region, the other embracing the black prairie region from northeastern Mississippi, south-eastwardly nearly through the central portion of Alabama. Within these belts the cotton acreage averages 130 per square mile, and upon them was produced in 1879 about 753,550 bales of cotton. Comparison of the total population of the states of the cotton belt proper, from North and South Carolina to Texas, shows in all but two cases an approximation to the proportion of one bale for every two inhabitants. The exceptional instances are Mississippi and Alabama, in which the ratio in 1879 was from two-thirds to over three-fourths bale per head.

In the cotton states proper, Mississippi stood in 1879 first in total production, while sixth in population, its product being 0.85, or over $\frac{8}{10}$ bale per head. It would at first seem as though this was due to the great fertility and large area of the Yazoo bottom; but only 25.5 per cent. of the cotton of this state comes from this district; one-half of the whole being grown in the first-class uplands, the table belt bordering the Mississippi bluffs and the two prairie belts. The remaining one-quarter is scattered over the sandy uplands, bearing more or less of the long leaf pine, that formed about one-half the area of the state. Georgia is second in total production, but from reasons very different from those obtaining in Mississippi. Georgia's area of first and second-class soils is limited. Her high position is owing to better cultivation of the soil, to the use of fertilizers, and to thrift. Tennessee has a total production less than half that of Alabama, but with an average product per acre one-half greater, equal even to that of Mississippi. While the central basin produces only about 1 per cent. of the total amount, the western part, between the Tennessee and the Mississippi rivers, produces 84 per cent. In this Western district, most of the cotton grows in the two tiers of counties next the Mississippi river. Of these, only a small part is bottom-land, the rest being rolling uplands.

Cotton grown on the uplands of Alabama, Mississippi, Louisiana, and Arkansas has a staple $\frac{7}{8}$ to $\frac{1}{4}$ inch long; that from bottom swamp lands, 1 to $1\frac{1}{4}$. Texas cotton ranges from $\frac{7}{8}$ to $1\frac{1}{4}$ inches in different sections.

The average yield per acre in the U. S. is .370 of a gross bale.

Cost of Production.—The following statement of the cost of production, and the pro

* City Point, Va., Brunswick, Ga., Pensacola, Port Royal, Indianola, etc.
† From Texas. ‡ From the Mississippi Valley.

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ceeds from a cotton crop in 1889–90 on the 70-acre farm of Col. J. M. Thornton, Talladega, Ala., is given especial prominence by Shepperson, who figures the cost of production of lint cotton, after deducting from the gross cost of production the amount realized from sale of the cotton-seed of the crop, at 5¼ cents per pound, and estimates the average cost of production in the Atlantic States and in the other parts of the cotton belt where fertilizers are used at about 7½ cents per pound, delivered at the nearest market to the plantations:

Cost of man and mule labor in preparing, bedding, and putting in fertilizers	$150.50
" " 3½ tons phosphate (as fertilizer)	67.50
" " 3½ tons cotton-seed meal (as fertilizer)	70.00
" " man and mule labor, plowing, and cultivating	126.00
" " hoeing	136.50
" " picking	421.75
" " bagging and ties	49.50
" " ginning (5 per cent. of yield=1458 pounds at 9½ cents)	134.86
" " seed for planting (140 bushels, at 15 cents)	21.00
" " wear and tear of implements	15.00
" " overseeing	50.00
" " one-fourth of cottton crop, chargeable as rent	650.18
" " hauling to market	12.50
	$1905.29

YIELD AND PROCEEDS.

56 bales, weighing 28,116 lbs., lint cotton, averaging 9½ cents	$2600.73
1848 bushels seed, @ 15 cents	277.20
	$2877.93
Profit on the 70 acres	$972.64
Proceeds per acre	$411.13
Cost per acre	272.18
Profit per acre	$138.95

Classification.—To fibres under 0.98 inches or 25 mm., in length, there has been given the name "short staple;" "medium" means from 0.98 to 1.17 inches (25 to 30 mm.) and "long" 1.18 to 1.57 inches (30 to 40 mm.); "extra," including those which are 1.58 inches (40 mm.) or more. The extra and the long in the U. S. seem to come from what Todaro describes as *Gossypium maritimum* or sea-island cotton; the short and medium corresponding to *G. hirsutum* and *G. herbaceum*. Of the total product of the United States in 1880, Florida made the best show as regards quality, sea-island cotton being predominantly grown.

As regards the lint on the seed of U. S. cotton, the greatest proportion in 1880 was from Winn, La., 43.79 per cent., this being grown on sandy hummock land. The smallest proportion was from new sandy pine land in Florida, only 11.45 per cent.; but this was mostly sea-island cotton.

In length of staple, the greatest was from Florida (mostly sea-island cotton), 1.384 inches average; the shortest from Arizona, 0.969 inch. The greatest width of staple was from Arizona, 0.957 thousandths of an inch; the least from Louisiana, 0.882 thousandths. In breaking strength, samples from California led, with 144.6 grains; the weakest being from Indian Terr., 119.3 grains. The highest percentage of lint for any state was from Virginia, 34.44 per cent.; the lowest from Arizona, 27.91 per cent. The general averages for the United States show in length, 0.91 inch, least, 1.07 medium, 1.32 most, 1.72 extra, and 1.10 for all. In width, 0.93 thousandths of an inch for the least, 0.91 medium, 0.88 most, 0.80 extra, 0.91 for all.

In strength 134.3 grains for the least, 122.8 medium, 123.5 most, 109.9 extra, and 125.6 for all. The percentages of different lengths were 24 short, 55 medium, 16 long, 5 extra.

The maximum weight of seeds with lint attached came from rich bottom land; the next, curiously enough, from poor sandy pine uplands; the third heaviest from black prairie land. Fibre from creek bottoms is the shortest, finest, and strongest, and the one yielding the largest weight of seed. That from sandy uplands is the longest and next in fineness, strength and seed-weight to the creek-bottom staple. The fibres from the prairie lands and the great alluvial bottoms are of the same length; considerably greater than that of the creek-bottom product, but decidedly less than that of the uplands. The river-bottom fibre is the whitest of all and in strength is slightly behind that of the uplands The prairie cotton is somewhat finer, but its strength considerably below that of all the rest.

The commercial classification of cotton in N. Y. is as follows: The "full grades" are Fair, Middling Fair, Good Middling, Middling, Low Middling, Good Ordinary, and

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Ordinary. Half grades are designated by the prefix "strict," quarter goods by prefixes "barely," meaning the point above the half grade and the next full grade above, and "fully," meaning the mean point between the half grade and the next full grade below. Liverpool high grades are lower, and low grades higher than New York.

Fabulous accounts reach us of the fineness of cotton fibres spun and woven in India in ancient times, but there are no reliable accounts thereof. It is, however, well authenticated that in Bolton, Lancashire, hand-woven mulls or Jaconet has been produced, 200 filling and 140 yarn; and in Scotland 160 filling and 120 warp is nothing extraordinary for power looms.

In thin material 5 harness sateen is mentioned, 50 yarn and 60 filling, with 700 picks to the inch. In plain cambric cloth, 100 yarn and 150 filling, 140 picks per inch, has been woven in America, but the climate is not favorable to its manufacture. The Willimantic mills had number 550 yarn at the Atlanta Exposition: and Scotch mills have produced number 680, American standard.

Distribution and Consumption.—Under this head we may consider, (1) the transactions at the various principal cotton markets, (2) the exports from and receipts at the principal cotton shipping ports, and (3) the amounts consumed by mills throughout the world.

Sales.—The principal cotton markets of the U. S., and the sales of spot cotton thereat during the season of 1889–90, are as follows: N. Y.,* 459,000 bales; New Orleans, 1,034,000; Galveston, 166,000; Savannah, 289,000; Mobile, 133,000; Memphis, 508,000; St. Louis, 231,000; Houston, 310,000; Shreveport, 75,000; Little Rock, 44,000; Vicksburg, 67,000; Columbus, Miss., 29,000; Augusta, Ga., 157,000; Macon, Ga., 56,000; Columbus, Ga., 81,000; Rome, Ga., 65,000; Selma, Ala., 82,000; Montgomery, 140,000; Eufaula, Ala., 30,000; Wilmington, N. C., 90,000; Nashville, Tenn., 38,000.

Exports.—The annual exports from each U. S. port for the season of 1889-90 were as follows: Galveston, 453,000 bales; New Orleans, 1,841,000; Mobile, 45,000; Savannah, 531,000; Charleston, 240,000; Wilmington, 112,000; Norfolk, 266,000; Baltimore, 122,000; New York, 761,000; Boston, 142,000; Philadelphia, 38,000; West Point, 180,000; Newport News, 38,000; Minor Ports, 137,000. Total exports, 4,906,000.

In the year ending Sept. 30, 1890, Great Britain exported 5,072,000,000 yards of cotton piece goods (equal to 1,014,000,000 lbs. of yarn); and 255,000,000 lbs. of yarn; total equalling 1,269,000,000 lbs. of yarn.

Amounts Manufactured.—The takings of cotton by Northern U. S. spinners, and by those of Canada for the season of 1889–90, were 927,000 bales overland, 909,000 from the ports, making total takings for the season of 1,836,000 bales.

The deliveries of cotton to European spinners are here given by Ellison in thousands of bales, for the season of 1889–90:

	American.	East Indian.	Brazilian.	Egyptian.	Sundries.	Total.	Average weight, lbs.	Total weight in millions of pounds.
To Great Britain....	2,770	304	110	242	27	3,453	465	1,605
To the Continent...	2,138	1,409	44	183	83	3,852	442	1,703
Total.....	4,908	1,713	154	425	110	7,305	452.8	3,308

The estimated number of cotton spindles in the U. S. is as follows:

Year.	In the Northern States.	In the Southern States.	Total in United States.
1880.....	10,095,000	584,000	10,679,000
1881.....	10,625,000	750,000	11,375,000
1882.....	11,250,000	900,000	12,150,000
1883.....	11,800,000	860,000	12,660,000
1884.....	12,250,000	1,050,000	13,300,000
1885.....	12,250,000	1,125,000	13,375,000
1886.....	12,250,000	1,150,000	13,400,000
1887.....	12,300,000	1,200,000	13,500,000
1888.....	12,300,000	1,250,000	13,550,000
1889.....	12,700,000	1,360,000	14,060,000
1890.....	12,800,000	1,605,000	14,405,000

Total spindles in the U. S. in 1896 was 16,811,000.

* Year ends May 31; for other points, season ends Aug. 31.

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The annual consumption of all Europe is estimated by Ellison at 3,982,000 bales of 400 lbs., for Great Britain, and 4,238,000 for the Continent.

The number of spindles in Europe and the U. S., Sept. 30, 1890, and the consumption of cotton for the season of 1889-90, are as follows:

	Number of Spindles (Round Numbers).	Annual Consumption per Spindle, lbs.	Annual Consumption in Bales of 400 lbs.
Great Britain	43,750,000	36.41	3,982,000
Continent	24,575,000	68.98	4,238,000
Total, Europe	68,325,000		8,220,000
U. S.	14,405,000*	75.97	2,736,000
Grand Total	82,730,000		10,956,000

Outside of the U. S. the number of spindles in operation in 1896 was: Great Britain, 44,900,000; Continent, 29,350,000; East Indies, 3,933,000, making the world's total, 94,994,000.

India is reported as having, June 30, 1895, 148 cotton mills, with 3,933,000 spindles, and an estimated annual consumption of 1,342,000 bales of 392 lbs. each.

Enemies of the Cotton Plant.—The principal enemies of the cotton plant are the cotton caterpillar and the bore-worm, although the cotton aphis or cotton louse, and rust, are also damage-workers.

The cotton worm (*Aletia Argillacea*) is a true moth, having the four regular stages of growth: the egg, the larva, or worm, the chrysalis, and the moth. The female moth usually lays three or four eggs to a leaf, on the under sides of the larger or lower leaves, in May or early in June, although later, the upper surface receives a share and larger numbers per leaf are found. The eggs hatch in three to four days, although the time varies with the temperature, and moisture favors hatching. The worm molts five times during the one to three weeks of the larval state. Until after the second molt it remains under the leaf; after the second it moves towards the upper and tenderer leaves, although it will eat the bolls and bark the stems. It thrives on no plant but the cotton. It moves by its thread and also by springing—its maximum spring being two feet. When fully grown it makes its cocoon, usually within the roll of a leaf, and sparsely lined with silk. It remains a chrysalis from one to three weeks, averaging two. The worm never burrows. The moth, as a rule, flies at night only. In two to four days after issuing from the chrysalis the female moth begins to lay—her average product being 400 eggs in the season. The natural food is the juice exuding from the glands on the leaf's midrib and at the base of blooms and bolls; but it will feed on any kind of fruit as it ripens. Until the worms are numerous enough to badly riddle the leaves, the moths continue to lay near their birthplace; then they migrate to considerable distances—seldom, however, until after the third generation of worms—say July 1, in southern Texas. Migrations are most common in the fall months, the moths flying at night and on cloudy days. In the southern states only the moths hibernate (the worms never, nor anywhere), hibernation being more frequent in the southwestern than in the Atlantic states. The moths hibernate under bark, in logs and timbers, etc., and mild winters are more severe on them than cold ones, which keep them torpid.

In some districts there are as many as seven generations in a season. The average time from the egg of one generation to that of the next is a month.

The caterpillars visit earliest low alluvial lands where the plants are luxurious and thrifty. Moisture is favorable to their development, hot, dry weather infavorable. The damage to the crop may reach 25% in the southern districts; but in the northern the worms may do more good than harm, by removing superabundant leaves and thus facilitating ripening of the bolls.

The boll-worm (a true moth) is hatched from eggs deposited singly in all parts of the plant, taking only 3 to 5 days to hatch in summer. The worm is much like the cotton caterpillar, but larger. Its principal food is the flowers and bolls. The chrysalis is found a few inches underground. The chrysalis state lasts 7 to 10 days in mid-summer, double that in cooler weather. The moth is in appearance and habits much like the *Aletia*, but seldom appears before July or August. Hibernation is in the chrysalis state only, and underground. Breeding continues until cold weather; but the first three generations of each year generally feed in the cornfields, the first lot seen on cotton being the fourth brood.

The natural enemies of the cotton worm and of the boll-worm are domestic fowls, birds, spiders, beetles, wasps, ants, etc.—blackbirds, rice birds, and ants being the most destructive. As preventive measures, the free use of poisons is good for both, and fall plowing, which upturns the chrysalides of the boll-worm, exposes these to the attacks of fowls, and the fatal influence of cold.

* Of these, 1,360,000 were in the southern states.

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For general information on the subject of cotton and its manufactures, the reader is referred to the following works: Marsden, *Cotton Manufacture* (2d ed., 1886); Royle, *Culture and Commerce of Cotton in India* (1851); Dana, *Cotton, from Seed to Loom* (1878); Ellison, *The Cotton Trade of Great Britain* (1886); the *Statistical Abstract of the United States* for 1890; also the articles CALICO PRINTING; COTTON FAMINE; COTTON-SEED AND COTTON-SEED OIL; SPINNING; WEAVING; MANUFACTURES; MUSLIN.

COTTON, CHARLES, 1630–87; an English translator and poet, educated at Cambridge. He was a friend of Izaak Walton, and accompanied him on his fishing excursions. His works, nearly all in verse, are translations of Corneille's *Horace;* the *Life of the Duke d'Espernon; The Fair One of Tunis*, a translation of Montaigne; *The Scarronides, a Virgil Travestie; The Voyage to Ireland*, and *The Wonders of the Peak.*

COTTON, GUN. See GUN COTTON; EXPLOSIVES OF HIGH POWER.

COTTON, GEORGE EDWARD LYNCH, D.D., Bishop of Calcutta (1813–1866), was born in England, educated at Westminster and Cambridge; and from 1836 to 1852 was a master at Rugby, being mentioned by Mr. Hughes in *Tom Brown's School Days* as "the young master." He was for six years Principal of Marlborough College, and in 1858 was made Bishop of Calcutta. In that office he successfully founded many schools. He was drowned in the Ganges in 1866.

COTTON, JOHN, 1585–1652; one of the earliest of Boston ministers, educated at Trinity college, Cambridge, and, in 1612, vicar of St. Botolph's church in Boston, Eng., where he remained 20 years. He leaned toward puritanism, for which he was cited to appear before archbishop Laud, instead of doing which he fled to America, arriving in Boston, Sept. 4, 1633. There he became pastor of the First church. He was well educated, and was remarkable for simplicity and plainness in his pulpit discourses. It is said that from his strictness in keeping the Lord's Day, came the New England custom of beginning Sunday on Saturday night at sunset; but this can scarcely be correct, as earlier sources for this custom can easily be traced. He is to be noted as a violent opponent of Roger Williams (q.v.).

COTTON, NATHANIEL, an English physician and poet, was born in 1707. As a physician he was very successful in his treatment of the insane, and it is worthy of remembrance that the poet Cowper (q.v.) was for a time under his care at St. Alban's, and spoke of him in terms of friendship. He wrote, besides other works in prose and verse, *Marriage, a Vision.* He died in 1788. Selections from his verse can be found in Campbell's *Specimens of the British Poets.*

COTTON, Sir ROBERT BRUCE, a distinguished English antiquary, founder of the Cottonian library, now in the British museum, was born at Denton, Huntingdonshire, 22d Jan., 1571. He was educated at Cambridge, and soon after taking his degree of B.A. in his 16th year, he commenced those archæological pursuits which have made his name famous, and proved of such immense value to British historians. The dissolution of the monasteries about half a century before, dispersed many valuable collections of manuscripts into private hands, and C. hunted up and purchased these wherever practicable. On account of his eminent abilities and great knowledge, he was frequently consulted by ministers of state on difficult constitutional points and international questions. In 1600, at the request of queen Elizabeth, who desired to have the views of the society of antiquaries on the matter, he wrote *A Brief Abstract of the Question of Precedency between England and Spain.* King James, by whom he was made a knight, employed him to vindicate the conduct of his mother, Mary queen of Scots, and also to examine whether the Roman Catholics, on account of whom some alarm was then felt in the nation, should be imprisoned or put to death. C. took the most humane view of the matter. His intimacy with the earl of Somerset led him to be suspected of complicity in the death of sir Thomas Overbury, and in consequence he was imprisoned for about five months. In 1629, a tract entitled *A Project how a Prince may make himself an Absolute Tyrant*, was obtained from his library, the tendency of which was considered dangerous to the liberty of the state. His library was accordingly declared unfit for public inspection, and he himself was denied all use of it. His heart being bound up in his library, he pined and died in less than two years after, on 6th May, 1631.

The COTTONIAN LIBRARY, which now forms so important a part of the British museum, was, after the death of sir Robert C.'s son and grandson, who augmented it considerably, invested in trustees for the use of the public. In 1730, the library was removed to Ashburnham house, Westminster, where the royal collection was; and in the following year a fire occurred in the house, in which about 114 out of the 958 MS. volumes of which the library consisted were reported as "lost, burned, or entirely destroyed; and 98 damaged so as to be defective." Fortunately, however, under the care and intelligence of skillful keepers, a great number of these injured volumes have been restored, so that the library now consists of nearly 900 volumes, of which, says Mr. Edwards in his *Memoirs of Libraries*, "nearly 200 are state papers of the highest value. They include a vast series relating to the diplomatic intercourse between England and almost every state of Europe, extending from the reign of Edward III. to that

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of James I.; and of these documents, no small proportion consists of the original letters of sovereigns and of statesmen. Even those papers which are not original have a high degree of authority, as being, for the most part, coeval transcripts." The Cottonian library was transferred to the British museum (q.v.) in 1757. In addition to the MSS., the Cottonian collection consists of many valuable coins and antiquities.

COTTON FAMINE. The history of manufacturing industry does not present a more striking episode than that which was connected with the effects of the civil war in America on the cotton manufactures of Great Britain in 1861 and following years.

The years 1859 and 1860, unparalleled for the magnitude of the cotton manufacture, had much to do with the collapse that followed. So rapidly has this branch of industry increased in Lancashire, that the immigrants into that county from other districts have varied from 10,000 to 20,000 a year for a long series of years, irrespective of the natural increase of population by the excess of births over deaths. The imports of raw cotton, the exports of manufactured cotton, the number of mills, the number of hands, all were at their maximum in 1860. The imports were 1390 million lbs., of which 1054 millions were worked up in Great Britain. There were 1920 mills in Lancashire, 275 in the adjacent portions of Cheshire and Derbyshire, and enough elsewhere to make up a total of 2,650. There were 440,000 hands employed in these mills; by age, 90 per cent adults and young persons, and 10 per cent children; by sex, 44 per cent males, and 56 females. The machinery was worked by steam-engines having an aggregate of 300,000 horse-power. There were more than 30,000,000 spindles, making from 4,000 to 6,000 revolutions per minute; and 350,000 power-looms. The fixed capital in mills and machinery was valued at £54,000,000; while the money paid for wages in that year was £11,500,000. The cotton goods of various kinds manufactured for home consumption used up 180 million lbs. of cotton, and were valued at £24,000,000; while the exported goods—consisting of 2,776 million yards of calico, muslins, etc., and 197 million lbs. of yarn—were valued at the enormous sum of £50,000,000; besides £2,000,000 more for cotton hosiery and small wares. The total value for home consumption and export, £76,000,000, exceeded the total imperial revenue for that year. Considering that, of 1390 million lbs. imported, no less a weight than 1120 millions came from the United States, there is at once evidence afforded of the tremendous effect that would be produced by any stoppage in the American cotton-trade. Irrespective of this, however, there would have been a stagnation in our manufacturing districts in 1861, even if raw cotton had been plentiful and cheap. The manufacturers had glutted all the markets by the wholly unprecedented extent of their operations in 1860. The English warehouses, as well as those elsewhere, were full; and time was needed to carry off the immense stock. There were cotton goods on hand in Great Britain at the end of the year valued at £20,000,000; while in India our merchants continued to pour in goods even when the consignments of 1860 exceeded £17,000,000.

Fort Sumter was bombarded in April, 1861. This was virtually the beginning of the American civil war, and the beginning also of the rise in the price of cotton. A blockade was early established by the federal government of Washington; and it was only by "running" this blockade that cotton-laden ships could clear from the southern or confederate ports. The price of middling Orleans (the kind of cotton mostly used, and that which governs the price of all other kinds) rose from 7½*d.* to 9*d.*, 10*d.*, and 12*d.*, as the year advanced. There was thus a twofold motive for lessening the operations of the Lancashire mills—the markets were so fully supplied with manufactured goods, that no immediate augmentation was necessary; while the increase in the price of the raw material rendered manufacturing less profitable than before. The Liverpool dealers made colossal fortunes by the enormous rise in price of every bale of cotton which could reach the country from any quarter; while the manufacturers were also prosperous, because they could sell their accumulated stocks of calicoes and yarns at much higher prices than had been obtainable in 1860. It was the operatives who suffered. One by one, the mills were put upon half-time, because the mill-owners had not much inducement to spin and weave, under the extraordinary double influence above adverted to. It was not until autumn, however, that these effects were heavily felt, when there was the enormous quantity of 1000 million lbs. of cotton, raw and manufactured, on hand in Great Britain. When half-time began at the mills in Oct., there were, in Lancashire and the two neighboring counties, 890 spinning-mills, 593 weaving-mills, 635 spinning and weaving mills, and 152 other cotton-mills of miscellaneous kinds, employing 369,453 factory-hands; and all these four classes of establishments became equally embarrassed. India or Surat cotton could still be had in considerable quantity, at 10*d.* per lb. instead of its former price of 5*d.*; but it was greatly out of favor, on account of its dirty condition and the shortness and hardness of its staple. In Nov., there were 49 mills stopped, throwing out 8,063 hands, while 119 were working half-time—placing something like 20,000 persons on half their usual wages. In Dec., middling Orleans rose to 12*d.* So singular was the state of things, and so unlike what would be called a "famine," under other circumstances, that the actual quantity of raw cotton in Great Britain at the end of the year (280 million lbs.) was greater than ever before known in the history of the trade; but as the market-price of yarns and piece-goods at that time scarcely equaled that of raw cotton, *plus* wages, the manufacturer could scarcely operate without a loss; and, therefore, he either closed his mill, or placed his hands on half-time. It was not so much a famine of cotton as a famine of employment.

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The year 1862 opened very gloomily. Relief committees began to be formed in Manchester, Wigan, Blackburn, Preston, and other towns, to distribute subscribed funds to such of the hands as were totally out of work. The streets were thronged with the unemployed; but there was no disturbance, and scarcely any begging. Sewing-schools were established by ladies in the several districts, to teach the factory girls useful domestic needle-work—of which they are generally very ignorant—to get them to make clothes for themselves and others; and to shield them from the vicious temptations which would beset them during a period of idleness. The ladies also won upon the affection of the girls by reading to them and sympathizing in many ways with their sorrows. Many of the manufacturers set apart large rooms as school-rooms and soup-kitchens for the boys and men, and abundant stores of soup were provided at 1*d.* per basin. The poor-law board sent down instructions to the local guardians how to give as much elasticity as possible to the system of parochial relief. In April, Blackburn had only 18 mills on full-time out of 84, the rest being either on half-time or closed; and there were 9,000 of the inhabitants receiving parochial relief. Most of the other towns were in nearly as bad a plight. In May, matters were worse; Preston had 10,000 operatives out of work, and Blackburn had just about half-employment for 27,000. Middling Orleans rose in price to 15*d.*, and manufacturers had more inducement to speculate in cotton than to spin it. Meanwhile, great efforts were made to assist the distressed operatives. The letters of a "Lancashire Lad" in the *Times*, with the text, "Con yo help us a bit?" made a great impression. The *Daily Telegraph* raised a fund of £5,000 by its own exertions. The Lancashire landowners established a "cotton district relief fund" in London, to which they subscribed £11,000 in one day; the lord mayor established a "mansion-house committee," which received subscriptions from all parts of the world; Manchester established a "central relief committee," as a nucleus for various local funds; while a great county meeting brought in £130,000, of which £70,000 was subscribed in one day in one room. Mr. Farnall was sent down by the poor-law board, as special commissioner, to superintend the plans for parochial relief. A rate-in-aid bill was passed through parliament, to enable the government to issue orders in council, authorizing parishes to raise money on the guarantee of future rates; it was only to be done where the current poor-rate had already reached a high figure, and the money raised was to be applied strictly to mitigate the distress of the operatives. Notwithstanding all these sources of assistance, the work-people became reduced to great distress. "The pawnbrokers' stores," said an eye-witness, "were glutted with the heir-looms of many an honest family. Little hoards were drained to meet the exigences of the time. Many found it the sorest trial of their lives to ask for food; and it is a happy circumstance for all to remember, as it is honorable to those of whom it is recorded, that none suffered more severely than those who had a struggle to overcome their unwillingness to subsist upon food which they had not earned. Rents were falling in arrears, and many a house which had held only one family, was now occupied by three or four, in order to economize rent, fuel, and furniture." Nevertheless, none died of privation, and the average sickness was even less than usual. It was a fact well ascertained, that spirit-drinking was less indulged in than in times of full wages. Meanwhile, the manufacturers began to make great profits; the prices of yarns and calicoes rose rapidly, and the stocks were sold off which had been so long on hand. Middling Orleans rose to 2*s.* 3*d.* in Oct., and thus there was less inducement than ever to purchase for the sake of manufacturing. Strange as it may appear, 50,000 bales of cotton were resold by the manufacturers themselves during the year, at the very time when the phrase "cotton famine" was on the lips of every one; but the simple fact was, that more profit could be made by reselling than by manufacturing.

It was a gloomy winter, that of 1862–63, for the mill-hands. In Oct., the loss of wages was estimated at £136,000 per week. In Nov., there were 208,000 persons in the Lancashire district receiving out-door parochial relief, and 144,000 others aided by subscribed funds; there were at the same time 20,000 mill-girls at the sewing-schools. At Christmas, there were 250,000 hands totally out of work; those, and about as many more dependent on them, received £40,000 a week from the parishes and the committees. Vast sums were sent from various parts of the world to be spent in winter-clothing only, and prodigious stores of second-hand clothing were contributed by private families. As the money relief seldom exceeded 2*s.* or 2*s.* 6*d.* per week per applicant, to purchase clothing out of this was of course impracticable. The small shopkeepers also suffered greatly; for there was only one third the amount of wages received by their customers per week that had been received two years before. Emigration schemes were much discussed, but were not carried on very largely, because Lancashire men felt convinced that trade would revive after a time. Meanwhile, the *rate* of wages was not lowered; few mill-owners proposed it, and the operatives were rootedly against it; however small the quantity of work, it was paid for at the old rate.

No date can be named for the actual cessation of the distress; it died out by degrees. When the manufacturers had sold off their old stocks, they recommenced buying more to spin and weave; because, although the price of raw cotton was enormously high (2*s.* 5*d.* for middling Orleans in May, 1863), the selling price for calicoes and muslins was now proportionately high, and therefore they could manufacture at a profit. In June, 1863, a "public works act" was passed, to enable the government to advance £1,200,000 for public works in the cotton districts—partly to make good drainage, roads, water-supply, etc., and partly to yield £600,000 or £700,000 as wages to the unemployed cotton-

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hands in doing so much of the work as they could manage. The money (to be repaid by parish rates at subsequent dates) was to be advanced by the exchequer loan commissioners on the recommendation of the poor-law board, and a government engineer was to examine and sanction the several works to be executed. All these operations were to be confined strictly to the cotton districts, where the distress existed. Mr. R. A. Arnold, the resident government inspector of these public works, states in his *History of the Cotton Famine*, that by the month of June, 1865, there had been works planned, and in great part executed, under the clauses of this and a supplementary bill, to the amount of £1,846,000. They compromised the making or improving of 276 m. of street and highway, 304 m. of main sewer, reservoirs for 1500 million gallons of water, several parks and cemeteries, and a large area of land-drainage. Nearly 30,000 persons had been fed by the wages of the cotton operatives on these works. The subscriptions to meet the distress reached the vast sum of £2,000,000; while the out-door poor relief was about £1,000,000 more than in an equal period of average times.

The fluctuations in the value and quantity of cotton available during this extraordinary period are strikingly shown in the following parallel columns, relating to the raw cotton imported, and the money paid for it:

	Quantities (cwts.).	Value.
1860	12,410,000	£35,757,000
1861	11,223,000	38,653,000
1862	4,678,000	31,093,000
1863	5,978,000	56,278,000
1864	7,976,000	78,204,000
1865	8,782,000	66,032,000
1866	12,296,000	77,521,000

Remark here the sudden and tremendous increase in the amount paid for cotton in the latter half of the period; the payment, indeed, of forty millions sterling more in 1866 than in 1860, for about the same quantity. To show how India and Egypt benefited by this unprecedented state of affairs, we give (in pounds,* not cwts.) the quantities imported from those countries as compared with the imports from the United States:

	United States.	India.	Egypt.
1860	1,119,000,000	204,000,000	43,000,000
1861	816,000,000	369,000,000	41,000,000
1862	18,524,000	393,000,000	59,000,000
1863	6,394,000	434,000,000	94,000,000
1864	14,148,000	507,000,000	125,000,000
1865	139,000,000	446,000,000	177,000,000
1866	520,000,000	615,000,000	118,000,000

Look, again, at the prices per cwt.:*

	United States.			India.			Egypt.		
	£	s.	d.	£	s.	d.	£	s.	d.
1860	8	0	4	1	17	0	3	15	6
1861	3	12	5	2	17	5	4	4	9
1862	10	2	4	6	5	9	7	1	4
1863	11	5	8	8	18	11	10	11	8
1864	13	11	0	8	9	0	12	15	3
1865	9	18	6	6	5	7	8	16	1

The export of British Indian cotton is 1860 brought only £2,500,000; in 1864, it fetched £34,000,000. The largest quantity imported was in 1866. In 1876, the total value of Indian cotton was £5,874,704.

COTTON GRASS, *Eriophorum*, a genus of plants of the natural order *cyperaceæ*, having the fruit accompanied with long silky hairs which spring from the base of the ovary. The species are not very numerous; they are natives of the colder regions of the northern hemisphere. Several are found in America, and their white, cottony, fruit-bearing spikes are well known in our swamps and bogs. The cottony substance has been used in England for stuffing pillows, making candle-wicks, etc. Mr. Helliwell has shown that a firm and beautiful cloth can be made of it; and, according to him, it might be gathered in some places without cultivation, at a cost of a few cents per pound. The stems of a Himalayan species, *E. cannabinum*, called *bhabhur*, yield a very strong fiber, and are much employed for making cordage, being simply twisted into cables, of which rope-bridges are usually made; but they are not durable, and require much repairing every year.—C. G. is said to be valuable for sheep-pasture. Its leaves were formerly employed as a remedy for diarrhœa, and the spongy pith of the stem to expel tape-worms. See illus., GRAIN, ETC., vol. VI.

COTTON-SEED AND COTTON-SEED OIL. Cotton-seed is the seed of the cotton plant, a popular name of several species of *Gossypium*, natural order *Malvaceæ*, from which the well-known textile substance, cotton, is obtained. The seed, after the removal of the fibre, yields, upon pressure, a large amount of yellow oil, with a bland, nut-like

* The board of trade tables, from which these figures are taken, are often difficult to consult, on account of the quantities of cotton being stated sometimes in *bales*, sometimes in *cwts.*, and sometimes in *pounds*.

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taste. The cotton-gin was invented in 1794, but before this time, the utilization of cotton-seed had been attempted, and in 1770, samples of the oil were exhibited by the Moravians in Bethlehem, Pa. Previous to that time the seed had been allowed to rot on the ground by many of the planters, while some of the more discreet utilized it as food for cattle, sheep, and horses, although horses did not take to it kindly. Others dug furrow-trenches, and buried it in the rows on which the next crop of cotton would be planted. Some fed it raw to their stock, while others boiled it to make it possibly more palatable, but it was in many localities permitted to remain in heaps, becoming a waste product, and cumbering the premises. In 1820 a patent was granted on a process for extracting the oil, but the adoption of the mills was so slow, that at the end of fifty years only 26 cotton-seed mills had been erected. The latest statistics are given in the following table:

STATISTICS OF THE COTTON-OIL INDUSTRY.

Year.	Establishments.	Capital.	Employees.	Wages.	Cost of materials.	Value of products.
1860.....	7	$351,000	183	$75,956	$498,000	$741,000
1870.....	26	1,225,350	644	292,032	1,333,031	2,205,610
1880.....	45	3,862,500	3,114	880,330	5,091,251	7,600,921
1890.....	119	.....	6,301	1,907,827	14,363,120	19,335,947
1894.....	252	.....	....	.....	18,000,000	30,000,000

In 1885 tank cars were introduced and all crude oil is now shipped in that way. Only refined oil is shipped in barrels. The crude oil sells for 20 cents per gallon while the refined, known as "summer yellow," sells for 26 to 28½ cents per gallon. A prime summer yellow oil is also called butter oil and is used in the manufacture of oleomargarine, butterine, &c. When subjected to cold pressure it becomes salad oil. Summer white oil is obtained from summer yellow by bleaching, and winter white oil is the same as summer white except that it has been cold pressed.

The crude oil is used to some extent with other fats, in manufacturing soaps, and also in making glycerine. When refined, it is used as a table oil, and it is difficult to detect any difference between the extra-refined, and olive oil. It is preferable on many accounts for cooking purposes, is wholesome and nutritious, and entirely free from any unpleasant odor or taste. In the process of refining, the volume is reduced from 15 to 20 per cent., leaving a clean, limpid oil, light amber in color, odorless, and strikingly similar to the best of olive oil. It solidifies at 32° to 38° Fahrenheit. The oil-cake, or the cake which remains after the oil has been expressed, is found valuable as food for stock, and as a fertilizer for corn is highly prized. The hulls of the seed are a by-product of great value, both for fuel at the mills, and as food for cattle, and experiments have shown it to be valuable as good paper stock. The market value of the various by-products is estimated to be fully equal to the value of the oil itself.

COTTONWOOD. See POPLAR.

COTTONWOOD, a co. in s.w. Minnesota on the Des Moines river, and the tributaries of the Big Cottonwood, intersected by the Chicago, St. Paul, Minneapolis, and Omaha railroad; 640 sq. m.; pop. '90, 7412. Surface undulating and soil fertile. Co. seat, Windom.

COTTON WORM, the caterpillar of a moth of the tribe *noctuæ*. The insect is of triangular shape, about an inch long, the upper wings reddish gray, and the under wings darker. The caterpillars have 16 feet, and in creeping they raise the back like the inch-worm, or span-worm. They are green, with light yellow stripes, and black dots along the back. These worms are sometimes terribly destructive to young cotton plants.

COT'TUS, a genus of acanthopterygious fishes, of the *mailed cheek* family or *sclerogenidæ*, having a large depressed head, more or less armed with spines or tubercles, a tapering body destitute of scales, and two dorsal fins. Some of the species are marine, others inhabit fresh water. Of the latter, the bull-head (q.v.) is an example. The marine species are mostly found in northern seas. A few occur on the shores of Britain, of which the most common are the sea scorpion (*C. scorpius*) and the father lasher (*C. bubalis*), both of which are very often left by the receding tide in rock-pools, and amongst sea-weeds.

COTURNIX. See QUAIL.

COU'CHANT. In heraldry, a beast lying down, with his head up, is couchant. If the head is down, he is DORMANT.

COUCH GRASS, *Triticum repens*, also called *wheat grass*, *dog grass*, *quickens*, and *squitch* or *quitch*, a grass which, although of the same genus with wheat, is chiefly known to British farmers as a troublesome weed. It is common in most parts of Europe and North America. It grows to a height of 1½ to 3 ft., and has two-rowed spikes.

COUCHING. See CATARACT.

COUCY, RENAUD CASTELLAN OF, a court-poet belonging to the n. of France, who flourished probably in the latter part of the 12th century. The love-songs ascribed to

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him are distinguished above all similar productions of the same epoch by the great warmth of passion displayed. They are addressed, of course, to a mistress, whose name, in accordance with the fashion of the time, is not mentioned. From their contents, we can gather little or nothing of the circumstances of C.'s life, except that he had become a crusader, and had separated himself very reluctantly from the object of his adoration. It is supposed that he accompanied Philippe Auguste and Richard Cœur de Lion to the Holy Land, probably in the service of Raoul Sieur de Coucy, with whom, indeed, he is often confounded. Like Tristan and Isolde, C. and his mistress soon became patterns of true but unfortunate lovers. As early as the first half of the 13th c., the *Roman d'Aventure* gives a very prolix and incredible account of both. The best edition of the *Chansons du Châtelain de C.* was edited by Franç. Michel (Paris, 1830).

COUES, Elliot, m.d., b. Portsmouth, N. H. 1842; graduated at Columbia univ., Washington, D. C., 1861; was surgeon in several army posts; sec. and naturalist of the U. S. geological survey of the territories, 1876–80; 1877–83 prof. of anatomy in the National Medical college; and contributor of biological and zoological definitions to *The Century Dictionary*, 1889–91. He has written *A Key to North American Birds*, 1872; *Field of Ornithology*, 1873; *Birds of the North West*, 1874; *Check List and Dictionary of North American Birds*, 1882; *Biogen*, 1884, etc., and edited Lewis and Clark's travels, 1893.

COU'GAR. See Puma.

COUGHING, considered physiologically, consists, 1st, in a long inspiration which fills the lungs to a greater extent than usual; 2d, in the closure of the glottis, or narrow opening in the organ of voice (see Larynx), at the commencement of the act of expiration; and 3d, in the sudden forcing open of the glottis by the violence of the expiratory movement In this way, a blast of air is driven upwards from the lungs through the mouth, which carries with it any sources of irritation that may have been present in the air-passages. C. may occur from irritation in the back of the throat, in the larynx, trachea, or bronchial tubes, and may be excited by acrid vapors, by irritant gases, or by articles of food or drink—such as even a drop of water or a crumb of bread—making their way into the air-passages instead of into the pharynx, or by excessive or morbid secretion from the walls of the air-tubes, or even by the entrance of cold air, when the lining membrane of the air-passages is abnormally irritable.

It is not very easy to explain to the non-professional reader *how* cough is produced. From the medulla oblongata, or uppermost part of the spinal cord (lying within the cavity of the cranium), there is given off a very important nerve, called, from its distribution to the lungs and stomach, the pneumogastric nerve (q.v.), which contains both sensory and motor filaments. The sensory filaments are distributed to the mucous lining of the larynx, trachea, etc. Any of the irritating substances already mentioned may produce an impression upon these sensory filaments which, being conveyed to the medulla oblongata, gives rise, through the motor filaments, to the transmission of motor impulses to the various muscles which are concerned in the act of coughing. Other motor nerves, especially those supplying the intercostal muscles and the diaphragm, co-operate powerfully with the motor filaments of the pneumogastric.

The object of C. in the animal economy is unquestionably to guard against the danger of the entrance of mechanical and chemical irritants into the air-passages; and accordingly the mucous membrane, especially of their upper part, is endowed with a most exquisite sensibility, which, when aroused by irritation or by a state of disease, provokes incessant coughing until the irritation be allayed or removed. Cough is an exceedingly common symptom of all diseases of the respiration. See Pneumonia, Consumption, Bronchitis, Catarrh, etc.

COULOMB, Charles Augustin de, known by his experiments on friction, and his invention of an instrument—the *torsion balance* (q.v.)—to measure the force of magnetic and electrical attraction, was b. at Angoulême in 1736, and in early life entered the engineers. In 1777, he gained a prize by an essay on the construction of magnetic needles (*Sur les Aiguilles Aimantées*). In 1779, his *Théorie des Machines simples* gained the prize offered by the academy; and in 1781, he was a third time successful in an essay on the friction and resistance of cordage, etc., used in machines. In the same year he was elected as member of the academy, and his services were employed on all the most difficult problems in mechanics. Having offended certain influential persons by reporting unfavorably on their project of a navigable canal in Bretagne, C. was for some time imprisoned, but received from the states of Bretagne a present of a seconds'watch, as a reward of his firm opposition to an expensive and unprofitable scheme. C. lived in retirement during the revolution; member of the institute, 1804; d. Aug. 23, 1806.

COULOMB, unit of quantity. See Electricity.

COU'MARIN, or Ton'ka Stëarop'ten (see Oils), is a camphor-like substance of a very agreeable smell, which gives their fragrance to the well-known Tonka bean (q. v.), (*dipterix odorata*), so much used for flavoring snuff; the woodruff (*asperula odorata*; the melilot, *melilotus officinalis*; a number of grasses, as the sweet-scented vernal grass (*anthoxanthum odoratum*); and the faam or faham leaves (*angræcum fragrans*), much prized among the Asiatics for their vanilla-like scent; and is probably the cause of similar fragrance in many other plants. C. may be produced from Tonka beans

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by digestion in ether. It crystallizes in small prisms, is colorless, has the smell of the bean, and is scarcely soluble in cold water, but dissolves pretty easily in boiling water. A beverage well known in Germany as *May drink*, and made of wine and woodruff, derives its flavor from coumarine.

COUNCIL, among Congregationalists and Baptists is an assembly of ministers and delegates from neighboring churches, called by a local church, as occasion arises, to act or assist in ordaining a minister, or give advice on matters referred to it. Its power is only advisory. They have also a national C., whose name has been criticised as not accurately indicating its character, composed of delegates from all parts of the denomination, and meeting for conference concerning its work and welfare. The Pan-Presbyterian C. is composed of delegates from Presbyterian bodies throughout the world, and meets for conference on matters of general interest to the denomination. In the Reformed Episcopal church, each parish, in addition to the vestry which has direction of its temporal affairs, has a C., chosen by communicants, that holds an advisory relation to the pastor, and is associated with him in the reception, discipline, and dismission of members. The synodical C. is composed of delegates from a certain number of parishes; and the general C., representing the whole denomination, is clothed with supreme legislative authority. See LETTER MISSIVE.

COUNCIL, PRIVY. See PRIVY COUNCIL.

COUNCIL, or SYN'OD, is an assembly of ecclesiastical dignitaries held for the purpose of regulating the doctrine or discipline of the church. As early as the 2d c., church councils were convened in which only one or two provinces took part, the bishops and presbyters binding themselves to carry out the decisions arrived at in their own communities. These assemblies were commonly held in the chief town or metropolis of the province, and the bishops of such capitals—who, after the 3d c., bore the title of *metropolitan*—were wont to preside over the meetings, and to consider questions of doctrine and discipline which had arisen within the territory. Over these metropolitan councils were established, at a later period, the provincial synods, exercising authority over several united provinces, and finally, the national councils. After the 4th c., when the Christian religion was established in the Roman empire, we read of *œcumenical*, i.e., universal councils, so called because all the bishops of Christendom were invited or summoned by the emperor. In some early synods, we find bishops, presbyters, and others, taking part in the deliberations; but after the opening of the 4th c., only the bishops were convened. According to the doctrine of the Roman Catholic church, the pope alone, or, by way of exception, in some cases the college of cardinals had the power of convening œcumenical councils, which, in the Catholic view, represent the universal church under the guidance of the Holy Ghost. Questions were determined by the majority of votes, and the pope or his proxy presided and confirmed the resolutions carried in the synod. In matters of faith, the Holy Scriptures and the traditions of the church are the guide; while in lighter matters, human reason and expediency were consulted. In the former, œcumenical councils are held to be infallible, but in other matters of discipline, etc., the latest synod decides questions. The question of the pope's subordination to the decrees of the œcumenical councils was long and warmly debated, but the recent Vatican council may be said to have set the question at rest. Twenty œcumenical councils are recognized in the Roman Catholic church—9 eastern and 11 western.

1. The synod of apostles in Jerusalem, wherein the relation of the Christian doctrine to the Mosaic law was determined. (See Acts, c. XV.) 2. The first C. of Nice, held 325 A.D., to assert the Catholic doctrine respecting the Son of God, in opposition to the opinions of Arius. 3. The first C. of Constantinople, convoked under the emperor Theodosius the great (381 A.D.), to determine the Catholic doctrine regarding the Holy Ghost. 4. The first C. of Ephesus, convened under Theodosius the younger (431 A.D.), to condemn the Nestorian heresy. 5. The C. of Chalcedon, under the emperor Marcian (451 A.D.), which asserted the doctrine of the union of the divine with the human nature in Christ, and condemned the heresies of Eutyches and the Monophysites. 6. The second C. of Constantinople, under Justinian (553 A.D.), which condemned the doctrines of Origen, Arius, Macedonius, and others. 7. The third C. of Constantinople, convoked under the emperor Constantine V., Pogonatus (681 A.D.), for the condemnation of the Monothelite heresy. 8. The second C. of Nice, held in the reign of the empress Irene and her son Constantine (787 A.D.), to establish the worship of images. 9. The fourth C. of Constantinople, under Basilius and Adrian (869 A.D.), the principal business of which was the peace of the eastern and western churches, and the deposition of Photius, who had intruded himself into the see of Constantinople, and the restoration of Ignatius, who had been unjustly expelled. 10. The first Lateran C., held in Rome under the emperor Henry V., and convoked by the pope, Calixtus II. (1123 A.D.), to settle the dispute on investiture (q. v.). 11. The second Lateran C., under the emperor Conrad III. and pope Innocent II. (1139 A.D.), condemned the errors of Arnold of Brescia and others. 12. The third Lateran C., convened by pope Alexander III. (1179 A. D.), in the reign of Frederick I. of Germany, condemned the "errors and impieties" of the Waldenses and Albigenses 13. The fourth Lateran C., held under Innocent III. (1215 A. D.), among other matters, asserted and confirmed the dogma of transubstantia-

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tion and necessity for the reformation of abuses and the extirpation of heresy. 14. The first œcumenical synod of Lyon, held during the pontificate of Innocent IV. (1245 A.D.), had for its object the promotion of the crusades, the restoration of ecclesiastical discipline, etc. 15. The second œcumenical synod of Lyon was held during the pontificate of Gregory X. (1274 A.D.). Its principal object was the reunion of the Greek and Latin churches. 16. The synod of Vienne in Gaul, under Clemens V. (1311 A.D.), was convoked to suppress the Knights Templars, etc. 17. The C. of Constance was convoked at the request of the emperor Sigismund, 1414 A.D., and sat for four years. It asserted the authority of an œcumenical C. over the pope, and condemned the doctrines of John Huss and Jerome of Prague. 18. The C. of Basel was convoked by pope Martin V., 1430 A.D. It sat for nearly ten years, and purposed to introduce a reformation in the discipline, and even in the constitution, of the Roman Catholic church. All acts passed in this C., after it had been formally dissolved by the pope, are regarded by the Roman Catholic church as null and void. 19. The celebrated C. of Trent, held 1545–1563 A.D. It was opened by Paul III., and brought to a close under the pontificate of Paul IV. The Vatican C., above mentioned, held in 1870, decreed the infallibility of the pope. For details of important councils, see NICE, BASEL, CONSTANCE, TRENT, etc.

Among the provincial or local synods convened after the division of the church into east and west, we may mention that of Clermont (1096 A. D.), when the first crusade was proposed, and that of Pisa (1409 A. D.), when three popes were contending for the see of Rome. Among Protestants, no general C. has ever been convened; but several particular synods have decided various questions. Of these synods, one of the more remarkable was that of Dort, in 1618, when Calvin's creed was asserted against the Arminians.

COUNCIL, TOWN. See CITY; MUNICIPALITY; TOWN.

COUNCIL BLUFFS, city and co. seat of Pottawattamie co., Iowa, on the Missouri river, 120 m. above Des Moines, and 1000 m. above St. Louis, on the Union Pacific and several other railroads; and connected by ferry and bridges with Omaha, Neb.; pop. '90, 21,474. The two great bridges across the river are 2,750 and 2,920 feet long respectively, and that of the Union Pacific railroad cost over $1,000,000. The city is nearly three m. from the river at the foot of the bluffs, a high and precipitous ridge. It is on a square, 6 by 4 m., making 24 sq. m. It is well laid out in rectangular blocks, and finely built, chiefly of brick. The noteworthy buildings are the county court house, the city hall, U. S. government building, Bloomer school, Masonic temple, Y. M. C. A. building, Union depot, and high-school. There are many important manufactories, churches, and schools; public library, Bayliss, Fairmount, Lake View, and Island parks; St. Francis Academy; and near by is the state deaf and dumb institution. It was a Mormon settlement in 1846, and was chartered as a city in 1853. There are extensive cattle yards, large grain elevator, etc. The name is in memory of a council held with the Indians by the explorers, Lewis and Clark.

COUNCIL OF WAR is a conference of officers, in military or naval warfare, on some matter in which the commander wishes to fortify his judgment by an appeal to that of others. The French make a special provision for a council of defense in a garrison. The governor or commandant may summon the heads of departments to meet him in consultation whenever he may think such a step desirable; and the opinions expressed at such meetings are placed upon record. The commandant of a garrison generally solicits the opinion of a C. of W. before surrendering to besiegers. The American military code leaves these matters to the discretion of the commander. In the navy, a C. of W. consists usually of flag-officers only; but officers of lower rank occasionally assist.

COUNSELLOR. See LAWYER.

COUNT (Fr. *comte;* Lat. *comes*). In classical writers, down to the end of the 4th c., the meanings attached to the word *comes* were comparatively few and simple. At first it signified merely an attendant, and differed from *socius* chiefly in expressing a less intimate and equal relation to the person accompanied. Suetonius uses it for an attendant on a magistrate. A little later, in Horace's time, it was applied to those young men of family whom it had become customary to send out as pupils under the eye of a governor of a province, or the commander of an army. Very soon the fashion of having similar attendants at home was introduced, and Horace speaks of this necessity as one of the miseries of a high position. The emperor, of course, had many *comites* in this sense; and to these, as he gradually became the center of power, he transferred the various offices of his household, and even of the state. Around his person these comites formed a sort of council of state, very much resembling that instituted by the first Napoleon. The example of the emperors of the west was followed by the emperors of the east, though at Byzantium the title attached less to the office than to the individual. Most of the titles of our own court officials are translations of those belonging to similar officers in the lower empire. The *comes sacrarum largitionum* was the grand almoner; the *comes curiæ*, the grand-master of ceremonies; the *comes vestiarius*, the grand-master of the wardrobe; *comes equorum regiorum*, the grand equerry, etc. The *comes marcarum*, or count of the marches, there can be little doubt, was the original of

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the *marquis* of later times. In France, the C. of the palace (*comes palatii nostri*) was the highest dignitary in the state after the *maire* of the palace; and in the 11th c., he had already acquired a rank apart from that of the other counts. He presided in the court of the sovereign in his absence, and possessed sovereign jurisdiction. The habit of instituting counts-palatine was adopted by Spain and England. Those counts, again, who, at a later period, as rulers of provinces, assumed something approaching to sovereign power, arrogating to themselves the right of appointing counts-palatine under them—e.g., the counts of Chartres, of Champagne, of Blois, Toulouse, etc.; and the ancient houses of Chartres and of Blois continued to claim in perpetuity the title of count-palatine as that of their eldest sons. Counts of this sovereign class owed their origin to the feebleness of the later Carlovingian kings, under whom they contrived gradually to convert the provinces and towns which they had governed as royal officers into principalities hereditary in their families. It was then that the counts came to be known by the names of their counties. Since the great revolution, the title of C. in France has been purely honorary, and has been used with a license which has almost deprived it even of that character. The title was never used in England, though its Latin equivalent has always been the common translation for earl (q.v.), and the wife of an earl, from a very early period, has been styled *countess*. For the history of the office in Germany, where it was of great importance, see GRAF.

COUNTER APPROACH, in military engineering, is a trench or passage, cut by the defenders of a fortified post from some of the outworks towards the besiegers, and leading to a battery in a small work. Its object is to enable the defenders to foil the approaches of the besiegers by carrying the fight further away from the body of the place, and enabling the besieged to enfilade the besiegers' batteries and approaches.

COUNTER-CHANGED, or CONTER-CHANGED, in heraldry. When several metals and colors are intermixed, one being set against the other, they are said to be counter-changed.

COUNTERFEIT. See COINING.

COUNTERFORT, in fortification, is a mass of stone or brickwork added to the revetment of a rampart, in such a way as to form a buttress for resisting the pressure of the mass of earth. Counterforts occur at intervals of about 20 ft., and assist in preventing the earth from pushing down the revetment-wall into the ditch.

COUNTER-GUARD, is an outwork designed to defend the two faces of a bastion or ravelin from a direct fire, so as to retard a breach being made. The counter-guard consists of two lines of rampart parallel to the faces of the bastion or ravelin, and separated from them by a narrow ditch. The crest of the counter-guard must be some three feet lower than that of the works it covers, in order not to obstruct the defense. Lest the enemy should establish a battery on the counter-guard, the terre-plein, or flat space behind its parapet, is made very narrow.

COUNTER-IRRITANTS, agents applied to the skin so as to redden (rubefacients), to vesicate (blisters or vesicatories), or to produce pustules, purulent issues, or even sloughs of skin and of the subcutaneous textures. The milder counter-irritants are mustard (see CATAPLASM), turpentine applied on warm cloths, and spirit or acetic acid in lotion. The stronger are blisters of cantharides (q.v.) or of ammonia; croton-oil (q.v.) or tartar emetic (q.v.), in ointment; setons, caustic or pea-issues, and the moxa; and above all, the actual cautery (q.v.) or hot iron. None of the stronger counter-irritants should be used without careful consideration and medical advice; great mischief is often done by their careless or improper use. Counter-irritants relieve internal pain, and tend to promote the absorption of morbid effusions. See MOXA.

Amongst horses, counter-irritants are much used for strains and diseases of the joints, but should never be applied, as they too often are, in recent cases, or whilst the part is hot or inflamed. Cantharidine preparations, or ointment of biniodide of mercury, are the most convenient. For cows, use hot fomentations, followed by the smart infriction of mustard-paste; for dogs, soap-liniment, strengthened, if required, by ammonia or turpentine.

COUNTERMARCHING. See MARCHING.

COUNTER-MARK, a stamp sometimes found on ancient coins, or medals, usually an inscription or a figure, and supposed to show that the article was captured from an enemy.

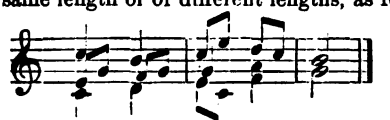
COUNTERMINE, in military engineering, is a gallery or chamber excavated under the glacis or some other part of a defense-work of a fortress. Its purpose is to foil a besieger. In a fortress on a large scale, there are envelope galleries, counter-scarp galleries, listening galleries, galleries of communication, and other subterranean passages, under various parts of the outworks, all for the purpose of assisting the defenders in discovering and frustrating plans laid by the besiegers. Listening galleries are sometimes pushed forward even to the foot of the glacis. In such places, selected men put their ear to the ground, and listen for the approach of the enemy, as denoted by the sound of tools used in driving a mine or gallery of attack. The sound of a pickaxe so employed can be heard through the ground at a distance of 60 feet. As there are no

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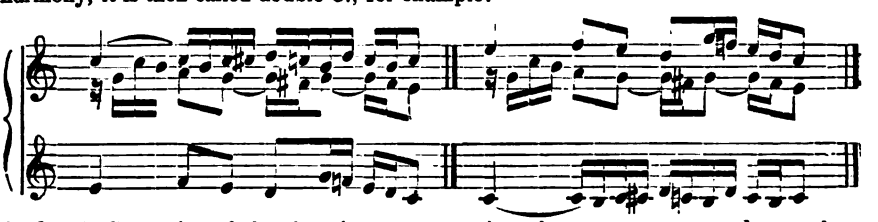
openings above, these galleries cannot be driven beyond a certain distance, as the sappers would be stifled for want of air. If a mine be driven to blow up the defense works, a C. is driven to blow up the besiegers; and sometimes the two parties carry their works so far as to meet in the subterranean passages, and there fight. If there be only a thin wall of earth left between them, they will fire pistols through bored holes, or drive in cartridges or smoke-balls. This terrible work is mostly carried on by sappers and miners.

COUNTER-PASSANT, in heraldry, when two beasts are passing each other the contrary way.

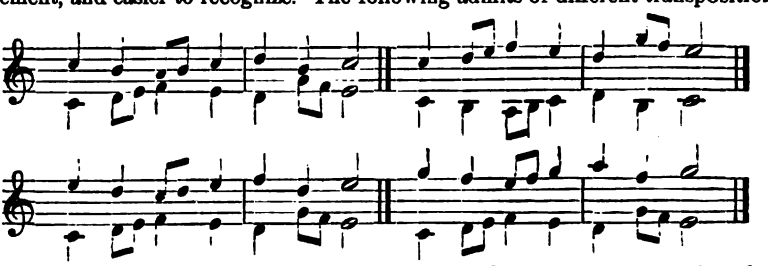
COUNTERPOINT, in music, means the setting of a harmony of one or more parts to a melody. In the early age of the science, notation was represented by mere points on the lines. The setting of parts to a melody already represented by a row of dots or points was therefore called *punctum contrapunctum.* In this respect C. is nothing else but the uniting of various harmonious parts. In a more circumscribed sense, it is the art or manner of accompanying a given melody with other parts. Simple C. is a musical combination where the melody of the parts is not mixed or changed, and may be either all in notes of the same length or of different lengths, as for example.



If the parts be constructed in regard to one another so that they can be changed or transposed over or under each other, without alteration in the movement, or injury to the harmony, it is then called double C., for example:



As double C. consists of the changing or transposing of one part over or under another, it follows that there must be as many different kinds of it as there are different intervals in the scale. We have, therefore, double C. of the octave as above, of the twelfth, tenth, ninth, etc. That of the octave is, however, the most useful, as it is more free in movement, and easier to recognize. The following admits of different transpositions:



The first indication of contrapuntal writing is to be found in the 12th c. by Adam de la Halle, who received a genuine artistic education in the Netherlands, but was far in advance of his time, for his style of music was forbidden to be performed in the church by a bull of the pope, who gave Palestrina an order to replace it with a more simple music. The best masters for C. have been Kirnberger and Albrechtsberger in former times, and in modern times, Schneider, Hauptmann, and Dehn.

COUNTER-PROOF. An impression which is obtained from a freshly-printed proof of an engraving, by laying it, before the ink is dry, upon plain paper, and passing it through the press. By this means the ink is transferred from the wet proof to the plain paper, and a reversed impression is obtained, which is often of use in enabling the engraver to judge of the success of his work.

COUNTERSCARP, in fortification, is the vertical, or nearly vertical side of the ditch nearest to the besiegers, and opposite to the scarp or escarp.

COUNTERSIGN, in military discipline or maneuvers, is a word exchanged between sentinels, inspectors of posts going their rounds, or persons having business with the soldiers in camp or garrison. The C. in use at any particular time is supposed to be known only to those immediately concerned, and is generally a simple word.

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COUNTERSIGN, the signature of a secretary, minister, or other subordinate, to any writing signed by the principal or superior, as a guarantee for its authenticity.

COUNTER-TENOR, the highest adult male voice, and the lowest female voice.

COUNTER-VAIR, a heraldic fur. It differs from *vair* by having its cups or bells of the same tinctures placed base against base, and point against point. The tinctures are OR and AZURE.

COUN'TERVALLA'TION, in military engineering, is a chain of posts constructed by the besiegers of a fortified place; it completely surrounds the place at a certain distance, and is intended to prevent sorties of the besieged. The posts are generally small redoubts, either isolated or connected by a line of earthworks. It is only during very protracted sieges that countervallations are constructed. They bear a certain relation to circumvallation (q.v.).

COUNTIES CORPORATE. In England there are certain cities and towns, some having territory annexed to them, some scarcely any, which possess the privilege of being governed by their own sheriffs and other magistrates altogether independently of the counties in which they are situated. The act 3 Geo. I. c. 5, for regulating the office of sheriff, enumerates 12 cities and 5 towns in this position. The cities are London, Chester, Bristol, Coventry, Canterbury, Exeter, Gloucester, Lichfield, Lincoln, Norwich, Worcester, and York. The towns are Kingston-upon-Hull, Nottingham, Newcastle-upon-Tyne, Poole, Southampton. From forming no part of the counties with which they were locally connected, they had no share in the county elections.

COUNTRY DANCE (Fr. *contre-danse*, of which the English term is a corruption), a dance in which as many couples can take part as there is space to accommodate them; at the commencement, the gentlemen being arranged on one side, and the ladies on the other. In its figure, the dancers are constantly changing places, leading one another back and forward, up and down, parting and uniting again. The numerous different figures, which give an interest to this dance, are generally designated with a particular name. The music is sometimes in $\frac{4}{4}$ time, and sometimes in $\frac{6}{8}$ time, and the step is more smooth than springing. The C. D. keeps its ground in England notwithstanding the introduction of many fashionable new dances. See DANCING.

COUNTY is a common, in fact universal, political division in the various states of the American union (except in Louisiana, where the similar division is called a "parish"). For purposes of local government, each county has at least one court and one prison, and usually an almshouse. The smaller divisions are townships, from three or four to a dozen or more in a county; and the supervisors of these towns, chosen by popular suffrage, form an administrative board to conduct the financial and other county affairs. In all the United States there are more than 3,500 counties. Usually each county chooses one or more members to the lower house of the state legislature. In some cities, such as New York, wards, or special election districts, answer for townships, and the boards of common council have the powers of supervisors. See SHIRE.

COUNTY COURTS. In most of the United States there is a regular court in each county, possessing the usual jurisdiction, and presided over by a judge elected by the people or appointed by the governor and senate. In New York, the judges are elected for four years. The courts have original civil jurisdiction only in cases where money or personal property not exceeding $100 in amount is demanded; and jurisdiction also in the foreclosure of mortgages on real estate, and the collection of what may be due after the sale of the property; the partition of real estate in the county; admeasurement of dower; management of the property of infants; mortgage and sale of the property of religious corporations, etc. The county courts have also supervisions of an appelate jurisdiction from decisions of justices of the peace. In counties that have a population of less than 40,000 the county judge acts as surrogate.

COUNTY RATE, a local tax levied in England and Wales, for the purpose of defraying the expenses to which counties are liable; such as the maintenance of bridges, jails, lunatic asylums, prosecutions and costs incident thereto, coroners, etc. It is levied on all property liable to be assessed for the relief of the poor.

COUP is a French word signifying "stroke." It is used in certain phrases that have become current in Europe. *Coup d'état*, "stroke of state," means an arbitrary encroachment suddenly effected by the governing authorities upon the constitution of the state, altering or setting aside the prerogatives of other parts of the body politic.—*Coup de main*, "a stroke of the hand," is applied, in the language of war, to a sudden and successful attack.—*Coup d'œil*, "a stroke or glance of the eye," is applied in speaking of persons who have the faculty of comprehending all the relations of a complicated matter at one survey; or, in art, it expresses the general effect of a picture or group at first sight.—*Coup de théâtre*, means properly a trick of the stage to produce an effect by surprise, and is hence applied to any analogous proceeding.

COUPÉ. A four-wheeled, one-horse, closed carriage, holding two persons, with separate seat for the driver. See CARRIAGE.

COUPED (Fr., *coupé*), in heraldry, is used to describe the head, or any limb of an animal cut off from the trunk, and smooth. It is distinguished from *erased*, i.e., forcibly torn off, and therefore ragged and uneven. A distinction is also made between

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couped and *couped close*, the latter signifying that the head or limb is cut off close, leaving no part of the neck or trunk attached to it. When crosses, bars, bends, and the like, are cut so as not to touch the sides of the escutcheon, they are also said to be couped.

COUPLES, the name given in statics to pairs of equal parallel forces acting in opposite directions, and at different points of a body. It is shown in the art. Parallel Forces (q.v.), that when two parallel forces act in opposite directions on a body, they may be replaced by one equal to their difference acting parallel to them in the direction of the greatest, at a point *not* between but *beyond* the points where they are applied; and which point recedes the further from their points of application the nearer they approach equality, getting to an infinite distance when they become equal, and when their resultant accordingly is zero. In this limiting case, the forces constitute a couple; they have no tendency to *translate* the body; their action goes wholly to make it rotate about an axis passing through its center of gravity, and perpendicular to the plane in which the couple acts. Such being the case, a couple cannot be replaced or counteracted by any single force, for such a force would produce translation; it can only be replaced or balanced by other couples. The length of the straight line which meets the lines of action of the forces at right angles is called the "arm" of a couple, and the product of the force into its arm is called its "moment."

Most of the leading propositions in the theory of C. are readily seen to be true, as soon as they are stated. For instance, as the axis round which a couple tends to make a body rotate passes through the body's center of gravity perpendicularly to the plane of the couple, it does not matter what position the couple occupies in its own plane. Also, supposing the body to be rigid, the couple may be moved into any plane parallel to its own, provided its new position be rigidly connected with the original position. It is also obvious, on the principle of the lever, that the efficiency of the couple depends on its moment simply, so that its arm may be shortened or lengthened at pleasure, provided the force be increased or diminished as the case may require, so as always to make the product of the force and arm the same. Suppose ropes fastened at the bow and stern of a ship pulling with equal force in opposite directions; they will make the ship turn round an axis through its center of gravity, at a rate depending on the force applied to the ropes. If the ropes be fastened to opposite points of the vessel nearer midships, it will only turn round at the *same* rate, provided the force applied to the ropes be *increased;* and, on experiment, it would be found that the force must be increased so as that its product into the distance between the ropes shall equal the product of the force in the first case into the length of the ship. Through this we can compound C. acting in the same plane, for we can turn them round till their arms coincide, and then give them a common arm; their forces will then act in the same lines, when their resultant into the arm will be the new couple. So two C. which are situated in planes inclined at any angle to each other may be replaced by a single couple. An illustration of this general idea is found in the known astronomical fact that a single planet revolving around the sun revolves about the common centre of gravity of the two. A second planet acts in like manner. The result is obtained by a composition of these results of the couples taken separately. Having seen how to compound C. whose planes are inclined to one another, the theory of the composition of C. may be said to be complete, for if they are in parallel planes, we know we can bring them into the same plane and to a common arm, and so into a common couple. In statical theory, any number of forces acting on a body, and not in equilibrium, may be reduced to a single force, a single couple, or a single force and a single couple. We have shown that the C. may all be reduced to one, as well as those forces which do not produce couples. If the single force do not act perpendicularly to the plane of the couple, it can always be compounded with the forces of the couple, so as to reduce the whole to a single force; if it act perpendicularly, then it cannot be compounded with the couple, and the body will have at once a motion of translation and motion of rotation.

COUPLET. Any two lines which rhyme together may be called a C.; but the term is more frequently used by critics to denote two lines which contain the complete expression of an idea, and are, therefore, to a certain extent independent of what goes before or what follows. The poetic wits of the age of queen Anne excelled in this kind of aphoristic versification. Pope, it has been said, reasons in couplets. For example:

> 'Tis with our judgments as our watches, none
> Go just alike, yet each believes his own.

COUPLING, an organ register, by which two or more rows of keys can be connected by a mechanism, so that they can be played together.

COUPLING-BOX. In mechanics, a device for uniting the ends of shafting. It may be either fixed permanently to the shaft, or made adjustable at will. One of the simplest and most effective forms has the shafts terminating with circular heads, one having teeth or projections, and the other corresponding indentations to receive them.

COUPON (Fr., *couper*, to cut), a term signifying any billet, check, or other slip of paper cut off from its counterpart. It is, however, applied chiefly to a dividend or

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interest warrant, which is presented for payment by holders of debentures. Coupons in Great Britain must now be stamped. By decision of the U. S. supreme court, 1885, a tender of coupons in payment of taxes is equivalent to a tender in money.

COURANT, in heraldry, always used for *running*, which is its meaning in French.

COURAYER, Pierre François de, 1681–1776; a Roman Catholic writer on theology, a native of Normandy. He published a work *On the Validity of English Ordinations*, in which he endeavored to prove that there had been no break in the line of ordination from the apostles to the English clergy. He was persecuted in France for his opinions, and fled to England. In 1736, he published a French translation of Sarpi's *History of the Council of Trent*, and afterwards a translation of Sleidan's *History of the Reformation*.

COURBET, Gustave, 1819–78; a French painter. He began to study law in 1859, but having a strong liking for art, he took lessons and studied the old masters, working privately for several years with little success. After the revolution of 1848, he began to be appreciated, and rapidly acquired fame. In 1871, he was an active leader of the commune, and directed the demolition of the Vendome column. When the commune failed he was caught and tried for treason, but was awarded only six months' imprisonment. Two years later he was prosecuted for destroying the Vendome column, and sentenced to pay the cost of re-erecting it. He was noted for studies of the nude female form.

COURBEVOIE, a t. of France in the department of Seine, situated on the left bank of the river of that name, about 5 m. n.w. of Paris. C. has well-built houses, mostly supplied with gardens, and large barracks erected by Louis XV. Its principal manufactures are white-lead and brandy, and it has commerce by the Seine. Pop. '91, 17,597.

COURCEL, Baron Alphonse Chandron de, French diplomatist; b. Courcel, 1835; was educated in France and Germany; entered political and diplomatic life in 1859; was for several years the ambassador of the republic to Germany; appointed French arbitrator on the Bering Sea arbitration commission in 1892, and elected president of that body by his associates in 1893; and became ambassador to Great Britain in 1895. He is a member of the French senate and an authority on international law.

COURIER, Paul Louis, a French scholar and political writer, was b. in Paris, Jan. 4, 1772. He served in the army till after the battle of Wagram, when he resigned. He then went to Switzerland and Italy, returning to France in 1812. Up to this period he was known publicly only by his translations from the classics. In 1816 he appeared for the first time as a political pamphleteer, and rapidly obtained a brilliant reputation. The piece in which he made his *debut* was the *Petition aux Deux Chambres*. In 1819–20, he published, in a journal called *Le Censeur*, a series of letters containing an exposition of his political ideas, which were those of an ardent constitutional reformer. These letters, for keenness, wit, and eloquence, have been compared to those of Pascal. His *Simple Discours* (1821) was directed against the project then entertained of purchasing Chambord for the Duc de Bordeaux in the name of the nation. It is exceedingly vigorous, clever, and sensible, and had a great success. For his audacity he was tried and condemned to one month's imprisonment. In 1823 he published his *Livret*, a kind of memorandum-book; and in 1824, his *Pamphlet des Pamphlets*, which is finely called by Armand Carrel *Le Chant du Cygne* (the Swan's Death-song). On the 10th April, 1825, he was assassinated near his own house at Veretz, in the department of Indre-et-Loire, a little before sunset. The murderer was never detected. C. was the pamphleteer of the middle class. Manly earnestness, pleasant wit, cutting irony, and admirable sense are his characteristics. Time, which generally dims the luster of a pamphleteer's reputation, has not touched that of C., which is still as bright as ever.

COURIERS. There are two distinct classes of couriers. The first to be noticed are employed by government to carry, securely and expeditiously, important dispatches to and from ambassadors at foreign courts. Active and accustomed to travel, speaking several languages, and with a sufficient idea of their own consequence, they will set out at a moment's notice, pursue their way by steamer, by rail, by hired voiture, or on horseback, with little intermission by night and by day, until they reach their destination. Acquainted with routes, officials, and methods of clearing the way, and provided with all proper credentials, including a requisite supply of cash, nothing interrupts them in their eager course. Such are *government C.*, a useful class of public servants. The other class of C. are not dissimilar in accomplishments, but their services are limited to private parties, and coming more generally into notice, we may enter more minutely into a description of their character.

Private Couriers.—These are usually persons of middle age, natives of Switzerland, France, or Germany, who have either been at some time gentlemen's servants, or been long employed as attendant on families while traveling on the continent. In some instances, they are of English origin, and have traveled again and again through Europe with employers who relish the dignity of having a man-servant, and dislike personal responsibility and trouble. Of whatever country, the courier has settled down into a perfectly cosmopolitan character. With equal fluency, he speaks English, French, Italian, and German, with perhaps Spanish, Portuguese, and Russian; he is acquainted with processes of getting passports and visés; knows the best routes, the best hotels,

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and where anything curious is to be seen. Acting for the time as a servant, he is not intrusive. Whether by railway or steam-boat, he knows his place, and makes his appearance only when he is wanted. No doubt, the courier is an expensive luxury; his usual wages being from $50 to $100 a month, independently of traveling-fares. His keep at inns is nominally paid by himself; but, of course, it weighs with the hotel-keeper in making out the bill. "A courier, however, though an expensive luxury, is one which conduces much to the ease and pleasure of traveling, and few who can afford one will forego the advantage of his services. He relieves his master from much fatigue of body and perplexity of mind, in unraveling the difficulties of long bills and foreign moneys, sparing his temper the trials it is likely to endure from disputes with innkeepers, postmasters, and the like. If clever and experienced, and disposed to consult the comfort of his employer, he is a most useful person. His duties consist in preceding the carriage at each stage, to secure relays of post-horses; he must make arrangements for his employer's reception at inns where he intends to pass the night; must secure comfortable rooms, clean and well-aired beds, and order meals to be prepared, fires to be lighted, taking care that his master is called and the post-horses ordered at the right hour. He ought to have a thorough knowledge of everything that relates to a carriage; he should examine it at the end of each day's journey, to ascertain whether it requires any repairs, which should be executed before setting out. He should superintend the packing and unpacking of the luggage, etc. It falls to the courier to pay innkeepers and post-boys; and he ought to take care that his master is not overcharged. Besides this, he performs all the services of waiting and attendance, cleaning and brushing clothes; and he is not perfectly accomplished unless he has a smattering of the art of cookery" (Murray's *Hand-book for Travelers on the Continent*). As among ordinary domestics, there are honest and dishonest C., and it is of importance that travelers should not hire them without proper recommendations as to character. For places at which C. are to be heard of, we refer to the work just quoted, also to Bradshaw's *Continental Railway Guide*. In Paris, information respecting them will be obtained at all the principal hotels.

COURLAN, *Aramus scolopaceus*, a wading fowl, the only one of its family. It is more than 2 ft. in length, with broad rounded wings, and cleft toes; the color usually chocolate brown streaked with white. It runs rapidly, but its flight is weak and short. Its note is between a squeak and a cackle. Its home is in Florida and the West Indies.

COUR'LAND, or KURLAND, a Russian government, and one of what are called the Baltic provinces, in lat 56° to 58° n., long. 21° to 27° east. It was formerly an independent duchy—properly, indeed, consisting of two duchies, Courland and Semgall—and belonged, along with Livonia, to the Teutonic knights. The difficulty of resisting the Russians led to the acknowledgment, in 1561, of the feudal sovereignty of Poland; and the last grand-master, Gotthard Kettler, secured the duchies of Courland and Semgall for his family. The country was long distracted by the contentions of two parties, one Russian and the other Polish; and after being for some time very completely under Russian influence, and the scene of many Russian intrigues, it was finally united to Russia in 1795. It contains about 10,500 sq.m., with a pop., in 1893, of 712,700, mostly Protestants. It is generally a level country, with ranges of low hills, and contains many lakes, bogs, forests, and downs, but some parts have a very fertile soil. The proprietors of land are mostly German; the peasantry, of Lettish or Esthonian extraction, are chiefly engaged in husbandry; there is little manufacturing industry or commerce. The capital is Mitau; but the most flourishing town is Libau.

COURSE, in building, is a continuous range of stones or bricks of uniform thickness.

COURSES, on shipboard, is a name given collectively to all the lower sails; above them is the group of topsails; and, highest of all, the group of topgallant sails. The C. comprise the mainsail, foresail, main-staysail, fore-staysail, and mizzen-staysail.

COURSING, a method of hunting hares by greyhounds, in which the dogs follow the game by *sight*, instead of by *scent*. C. is of very ancient date, having been practiced by the Greeks. Within the last 20 years, however, its popularity as a sport has greatly increased, and the breed of the greyhound is now studied with nearly the same care and zest as that of the race-horse. The method pursued in C. is briefly as follows:

Meetings are held in open districts, well frequented by hares, where the greyhounds —technically called "dogs," as foxhounds are technically called "hounds"—are entered by their owners for a variety of stakes, which are to be competed for—C., in this respect, partaking of the nature of a race between horses. The first thing done is to select a judge to decide upon the merits of the best dogs; second, a "slipper" is appointed to hold the dogs in leash, and start them at the hare; and, third, a flag-steward is chosen, who remains near the judge and announces the color of the victorious dog by means of a red or white flag, according as the competitors are arranged. The next thing done is to "beat" the field for a hare. When one is found, the judge usually allows it 80 or 100 yards "law" before he cries to the "slipper" to let the dogs "go." Upon the word "go," the "slipper" liberates the animals by a spring attached to the "slips"—i.e., the long strong cord held by the "slipper" and communicating with the leathern collars fixed round the necks of the dogs. The judge's duties now

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begin in earnest. He follows the dogs wherever they go, calculating carefully the number of "points" made by each—a "point" being any meritorious achievement on the part of the dogs (as when the one outstrips the other at any time, or turns the hare, i.e., causes it to "double"); and at last he adjudges the victory, not *necessarily* to the dog which has killed the hare, but to the one which has made the most points during the course, i.e., which has exhibited the finest qualities of speed, sagacity, endurance, etc.

COURT (Fr. *cour*, Ital. *corte*, from Lat. *cohors* or *chors*, *chortis*, an inclosure or cattle-yard; allied to Polish *grod*, a city; Sw. *gard;* Eng. *yard* and *garden*) was originally applied to the square or space inclosed by the buildings of a feudal castle; and hence it came to denote the persons immediately surrounding a feudal chief or superior. Its application is now confined to the residence and surroundings of sovereign princes. In England, and in other free countries, when we speak of the "court," we mean little more than the family and attendants of the sovereign, viewed not in a private, but a public capacity. The bishops and nobles, the ministers of the queen for the time being, and other persons entitled to precedence, either on hereditary, official, or personal grounds, are those who habitually encircle the sovereign; and "the court circle,' consequently, means those persons of distinction, and their families, who are in the habit of approaching the queen, and of associating with the other members of the royal family. But this circle is one the circumference of which is marked by no absolute line, like that which in France, under the old monarchy, divided the C. from the city.

COURT, ANTOINE, 1696–1760; called the "Restorer of Protestantism in France;" born of peasant parents, adherents of the reformed church, which was then undergoing cruel persecution. Court was 8 years old when the Camisard revolt was suppressed, and 19 when the infamous decree of Louis XIV. was published, declaring that all who professed the reformed faith should be punished as relapsed heretics. When but 17 years old, Court began to speak at the secret meetings of the Protestants, held literally "in dens and caves of the earth," and often in darkness, with no pastor present to teach or counsel. He entertained a great desire to build up the church so ruthlessly persecuted; and to this end he proposed four things: 1. Regular religious meetings for teaching and worship; 2. Suppression of the fanaticism of those who professed to be inspired, and of the consequent disorders; 3. Restoration of discipline by the establishment of consistories, conferences, and synods; and 4. The careful training of a body of pastors. To the exercise of this great task he devoted his life. From audiences of half a dozen trembling in secret, he came to address openly 10,000 at one time. In 1724, further fury was hurled at the Protestants in a decree which assumed that there were no Protestants in France, and prohibiting the most secret exercise of the reformed religion. A price was set on Court's head, and in 1730 he fled to Lausanne. There, after immense exertion, he founded a college for the education of clergy, of which, during the remaining 30 years of his life, he was the chief director. This college sent forth all the pastors of the reformed church of France until the close of the 18th century. Court intended to write a history of Protestantism, and made extensive collections for the purpose; but he did not live to do the work. He was the father of the more widely known Court de Gibelin.

COURT, PRESENTATION AT. The honor of being presented at court, or introduced to the English sovereign, is only to be obtained by persons of position, and is a thing sought after not only for the *éclat* of the ceremonial, but as giving a certain stamp of character; for, having been received by the sovereign, a person may with justice expect to be received anywhere. Valuable so far as a credential, a reception at court is carefully guarded from abuse. At the court of her majesty, queen Victoria, there is a scrupulous and very proper exclusion of all parties, male or female, of damaged reputation. Those who aim at the distinction of being presented at court belong chiefly to what are called the higher circles—nobility and landed gentry; officers in the army, navy, and higher departments of the civil service; judges, magistrates, church-dignitaries, members of the learned professions; and the wives and daughters of these respective classes. Men of scientific, literary, or artistic attainments do not generally attempt to appear at court, and neither, of course, do the classes engaged in trade. It is usual to be presented on taking office, or on attaining some personal dignity, or on arriving from an important and distant expedition. Young ladies of good family are said "to come out," on being presented at court. What perhaps contributes more than anything else to secure selectness, is the obligation of appearing in "court-dress," an expensive and somewhat fantastic costume of old date; from which only those who assume professional uniforms are exempted. As is well known, the court-dresses of ladies are superb. It will thus be seen that the notions prevailing among foreigners arriving in England—those from the United States in particular—as to the practicability of indiscriminate presentation at court, are erroneous. It is the duty of the lord chamberlain at St. James's to furnish information regarding the steps to be adopted by those who desire to be presented at court, either at levées, which are restricted to gentlemen, or at drawing-rooms, which are chiefly, though not exclusively, intended for ladies. The days on which these receptions take place are advertised in the newspapers some days before, with the necessary directions for preventing confusion. Her majesty's birthday is the occasion on which

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the greatest reception of the year takes place, but there are no new presentations on that day. Any British subject who has been presented at court in England, can claim to be presented by the British ambassador at any foreign court. Those who wish to be mere spectators, can obtain tickets to the corridor, where they see the company passing in and out, by applying to the lord chamberlain. For this purpose, however, an introduction is required. It is indispensable that the names of gentlemen desiring to be presented, and of the nobleman or gentleman who is to present them, be sent to the lord chamberlain's office several days previously, in order that they may be submitted for the queen's approbation. Gentlemen are also requested to bring with them two large cards, with their names clearly written upon them, one of which is left with the queen's page in the presence-chamber, and the other is delivered to the lord chamberlain, who announces the name to her majesty. The same rules apply to ladies. Lists of presentations appear next day in the principal London newspapers,

COURT, in law, in the United States, a body in the government to which the public administration of justice is delegated. The presence of a sufficient number of the members of such a body regularly convened in an authorized place at an appointed time, engaged in the full and regular performance of its functions, is a court. Courts are said to belong to one or more of the following classes, according to the nature and extent of jurisdiction and proceedings, and the principles on which they administer justice: admiralty, appellate, central, civil, criminal, ecclesiastical, equity, general jurisdiction, inferior, law, limited jurisdiction, local, martial, not of record, original jurisdiction, of record, superior, supreme, and in some states there are other classifications. See JUDICIARY IN THE U. S.

COURTALLUM, a t. of the district of Tinnevelly, in the presidency of Madras, stands in lat. 8° 56′ n., and long. 77° 20′ e., near the junction of the eastern and western Ghauts. Open towards the e., at a height of 700 ft. above the sea, it is elsewhere embosomed in hills, having in its immediate neighborhood a deep glen which affords easy communication between the opposite shores of Hindustan. The place is a favorite retreat for invalids, deservedly enjoying a reputation for salubrity of air, richness of vegetation, and beauty of scenery. The indigenous flora comprises 2,000 species, and many exotics, such as the nutmeg, clove, and cinnamon, have been introduced with success.

COURT OF CLAIMS. See JUDICIARY IN THE United States.

COURT OF COMMON PLEAS. See COMMON LAW, COURTS OF.

COURTESY, or CURTESY, in law, is the life interest which the surviving husband has in the real or heritable estate of the wife. It is remarkable that, both in England and in Scotland, this customary right should be regarded as a national peculiarity—that in England it should be called the C. of England, and in Scotland the C. of Scotland—whereas it is well known to be peculiar to neither of them. Traces of it are to be found in a constitution of the emperor Constantine (code 6, 60, 1); and there can be no doubt that it had found a place, with all the peculiarities which now belong to it, in the *coutume* of Normandy, from whence there is every reason to think that it was transferred to England (Barnage, vol. ii. p. 60; Stephen's *Com.* vol. i. p. 264; Fraser's *Domestic Relations*, i. p. 635). The four circumstances which are requisite to make a tenancy by C. in England are—marriage, seizin of the wife, living issue, and the wife's death. The rule that the child must have been heard to cry, which at one time was followed in England, is still adhered to in Scotland. It is not necessary, however, in either country, that the child survive; it is enough that it was once in existence, although it should have died immediately after its birth. In both countries, the child must be the mother's heir, and it is consequently said that C. is due to the surviving husband rather as the father of an heir than as the widower of an heiress. By 19 and 20 Vict. c. 120, which enables tenants for life of *settled* estates (see SETTLED ESTATE) to make effectual leases for 21 years, subject to the exceptions and provisions in the act contained, a similar power is also conferred upon tenants by the C. of *unsettled* estates.

COURTESY TITLES. Titles of honor (q.v.) are imparted by the sovereign or other competent authority. Independently of these, there are C. T. assumed by or given to individuals, and which have no validity in law. The term courtesy title is best known in connection with the titles given by popular consent to the sons and daughters of certain peers. English dukes, marquises, earls, and viscounts have several titles, accumulated by distinct patents in their progressive steps in the peerage. Thus, a duke may at the same time be a marquis, an earl, a baron, and a baronet; a marquis may be also an earl, etc.; and an earl is almost always a baron. In ordinary parlance, they respectively take only their highest title. One of the inferior titles so set aside is permitted, as a matter of social dignity, to be assumed by the eldest son. For example, the duke of Bedford being also marquis of Tavistock, his eldest son takes the title of marquis of Tavistock; and the duke of Buccleuch and Queensberry being also earl of Dalkeith, his eldest son takes the title of earl of Dalkeith. When it happens that the inferior title is of the same name as the first, there is a somewhat different usage. For example, the earl of Gosford being also viscount Gosford, his eldest son, to prevent confu-

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sion, takes only the family surname, Acheson, with the prefix lord—lord Acheson. The younger sons of dukes and marquises have the courtesy title of lord prefixed to their Christian and surname: as, for example, lord Frederick Charles Cavendish, a younger son of the duke of Devonshire; or lord Archibald Campbell, a younger son of the duke of Argyll. The eldest son of an earl, when not a viscount, takes his father's second title of lord: as, for example, the eldest son of the earl of Wemyss is styled lord Elcho. A proper understanding of these conventional customs will serve to clear up some of the perplexities into which foreigners are apt to become involved in thinking of this highly artificial social system. It is to be kept in mind, that titles by courtesy do not raise their bearers above the rank of commoners; and that, consequently, they are eligible for election as representatives to the house of commons. Very many of the peers, indeed, begin their political career as county or borough representatives under their C. T.; serving in this way a kind of apprenticeship as statesmen before they are advanced, by the decease of their fathers, to the house of lords.

The daughters of dukes, marquises, and earls have the title lady prefixed to their Christian and surname; and in the event of their marrying a person of inferior rank, they retain the title lady with their Christian name, adding the surname of their husband. Yet, these are but courtesy titles. The only valid title they can claim in virtue of their birth, is the prefix honorable, which is applicable alike to the sons and daughters of peers. The wives of baronets receive the courtesy title of lady; their lawful designation being dame. Ladies who have had a title by a first marriage, retain it as a matter of courtesy when they are married a second time, though the alliance be with a person without a title—a circumstance sometimes leading to a certain awkwardness in designation. In Scotland, the eldest son of a baron has the courtesy title of master. For example, the eldest son of lord Elibank is styled master of Elibank.

The title right honorable is given in some few instances by courtesy to officials, as in the case of the lord advocate for Scotland. The judges of the court of session in Scotland, on first taking their seat on the bench, assume the courtesy title of lord along with their own surname or a territorial title. But such titles are used only senatorially. In writing, the real name is subscribed. The titles of Mr. or master and esquire (q.v.), are now given by courtesy to nearly all classes of persons. For an exact definition of titles by courtesy as applicable to members of the peerage, we refer to the *Secretary's Assistant*, London, 1831, and also to Badeau's *Aristocracy in England* (1886).

COURT-FOOL. From very ancient times there existed a class of persons whose business it was to while away the time of the noble and wealthy, particularly at table, by all manner of jests and witty sayings. Alexander the Great, Dionysius of Syracuse, Augustus and his successors, maintained such jesters. It was, however, during the middle ages that this singular and repulsive vocation became fully developed, and that the office of jester or fool became a regular and indispensable court office. The symbols of such a personage were: the shaven head; the fool's cap of gay colors, with ass's ears and cock's comb; the fool's scepter, which was variously formed; the bells, which were mostly attached to the cap, but likewise to other parts of the dress; and a large collar. The rest of the costume was regulated by the taste of the master. Of these professional fools, some obtained a historical reputation, as Triboulet, jester to king Francis I. of France, and his successor, Brusquet; Klaus Narr, at the court of the elector Frederic the wise of Prussia, whose jests have been repeatedly printed; and Scogan, court-fool to Edward IV. of England. The kings and regents in Scotland had their jesters, as was usual in their time; and the sarcastic sayings of some of these privileged personages—such as those of Patrick Bonny, jester to regent Morton—are still remembered among the national *facetiæ*. English court-jesters died out with the Stuarts; one of the last of the race being the famous Archie Armstrong, whose death took place characteristically, on April 1, 1646. Besides the regular fools recognized and dressed as such, there was a higher class, called merry counselors, generally men of talent, who availed themselves of the privilege of free speech to ridicule in the most merciless fashion the follies and vices of their contemporaries. Of these, Kunz von der Rosen, jester to the emperor Maximilian I.; John Heywood, a prolific dramatic poet and epigrammatist at the court of Henry VIII.; and Angely, a French courtier, were particularly distinguished for talent and wit. In all times, there existed at courts persons who, without becoming jesters by profession, were allowed the privilege of castigating the company by their witty and satirical attacks, or who served as the general butts. Among these were, on the one hand, the Saxon general Kyaw, celebrated for his blunt jests; and on the other, the learned Jacob Paul, baron Gundling, whom Frederic William I. of Prussia, to show his contempt for science and the artificial court system, loaded with titles. Flögel's and Nick's German treatises on this subject, and Dr. Doran's *History of Court Fools* are interesting works. Such a history forms a kind of barometer of the manners and morals of courts at different times. At a later period, imbecile or weak-minded persons were kept for the entertainment of the company. Even ordinary noblemen considered such an attendant indispensable; and thus the system reached its last stage, and towards the end of the 17th and beginning of the 18th century, was finally abolished It survived longest in Russia, where Peter the Great had so many fools that he divided them into distinct classes.

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COURT-HAND, a name given in England to the old, Gothic, or Saxon handwriting, as distinguished from the modern or Italian handwriting. The old way of writing continued to be used in the law-courts after it had been superseded elsewhere, and hence its name of court-hand.

COURTS-MARTIAL. *Army.*—Any general officer commanding the army of the United States, a separate army, or a separate division is competent to appoint a general court-martial either in time of peace or in time of war. But when any such commander is the accuser or prosecutor of any officer under his command, the court is appointed by the President, and its proceedings and sentence are sent direct to the Secretary of War, by whom they are laid before the President for his action. As many officers are detailed, from five to thirteen inclusive, as can be assembled without manifest injury to the service; the one highest in rank present being the president of the court. The members are named in the detail for the court, and they take their places in the order of their rank. A judge advocate is appointed in addition to the other officers, and he acts as prosecutor for the government, summons witnesses, keeps the record of the proceedings, informs the court on legal points, but has no vote either upon the findings or sentence of the court. The president is seated at one end of the table, having the judge advocate opposite him at the other end; the member next senior in rank is seated on the right hand of the president, the next ranking member on his left, the one following next to the second in rank, and so through the detail. The accused, his counsel, the witnesses, and interpreter, should there be one, are near the judge advocate. The oath to well and truly try the case and not to divulge the sentence of the court until it is published by proper authority, and not to disclose or discover the vote or opinion of any particular member of the court-martial, unless required so to do in a due course of law, is administered by the judge advocate to each member of the court before the trial proceeds; and the president of the court administers the oath to the judge advocate, to the effect that he will keep a true record and will not disclose the opinion nor divulge the sentence under the same circumstances as those which govern the members. The accused has the privilege of objecting to any and all of the members, but only for cause stated to the court, and to but one member at a time, the relevancy and validity of the objection to be determined by the court. Should the accused have no counsel the judge advocate can act for him in that capacity, in addition to his duties as prosecutor. Proceedings of trials are carried on only between the hours of eight in the morning and three in the afternoon, excepting in cases which, in the opinion of the officer appointing the court, require immediate example. The president of a court-martial, besides his duties and privileges as member, is the organ of the court to keep order and conduct its business. He speaks and acts for the court in each case where the rule has been prescribed by law, regulation, or its own resolution. In all of their deliberations the law secures the equality of the members. For disorderly conduct a member is liable, as in other offences against military discipline; improper words are to be taken down, and any disorderly conduct of a member reported to the convening authority.

The legal punishment for soldiers by sentence of court-martial, according to the offense and jurisdiction of the court under the law are, death; confinement; confinement on bread and water diet; solitary confinement; hard labor; ball and chain; forfeiture of pay and allowances; discharge from service, and reprimands; and, for non-commissioned officers reduction to the ranks, solitary confinement, or confinement on bread and water, is not to exceed fourteen days at a time, with intervals between the periods of such confinement not less than such periods, and not exceeding eighty-four days in any one year. The power to pardon or mitigate the punishment ordered by a court-martial is vested in the authority confirming the proceedings (except in the case of prisoners confined in the Leavenworth Military Prison), and in the President of the United States. The vote of the majority of the members of a court-martial binds the minority in all cases, except in awarding the death penalty, in which the concurrence of two-thirds of the members is required; unless it should be one of the following cases, in which the regulations provide for capital punishment: striking a superior officer; mutiny; failing to resist mutiny; sentinel sleeping on post; occasioning false alarms; cowardice and misbehavior before an enemy; compelling a superior to surrender a command to an enemy; disclosing the watchword; relieving the enemy with money, victuals, or ammunition; corresponding with the enemy; desertion, or advising another to desert, in time of war; violence to persons bringing provisions to the camp, garrison, or quarters of the forces of the United States in foreign parts; forcing a safeguard during a time of rebellion against the United States. For the last-named offense no option is allowed the court, the death penalty follows conviction. No person is liable to be tried and punished by a general court-martial for any offense which appears to have been committed more than two years before the issuing of the order for such trial, unless for some reason he shall not have been amenable to justice within that period. The proceedings are to be approved by the officer ordering the court, or by the officer commanding for the time being, before the sentence can be carried into execution. The punishment of death must be confirmed by the President, except in the cases of persons convicted for a capital offense in war times, in which the approval of the sentence by the general commanding in the field, or a department, will suffice.

Navy.—The law governing court-martial in the navy and the methods of procedure

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are very much the same as those for the army. The points of difference are largely due to the different nature of the two services rather than to any legal changes. The regulations prohibit the holding of army court-martial on board any vessel in the navy when in commission, nor can an army, volunteer, or militia officer order any public punishment or confinement in irons, to be inflicted on board on any one under his command, without the previous approval of the commanding officer of the vessel. The commander-in-chief of a squadron orders the court-martial, and the proceedings are subject to his action before being forwarded to the Navy Department. Disobeying lawful orders, striking a superior while in the execution of the duties of his office; holding or entertaining intercourse with an enemy or rebel, or receiving a message or letter from same; desertion in time of war; sleeping on watch, or leaving station without being regularly relieved, all subject the offender to trial by general court-martial. Included with the above are, willfully suffering any vessel of the navy to be stranded, or run upon rocks or shoals, or improperly hazarded; willfully injuring any of a vessel's tackle, armament, or equipment; unlawfully setting on fire or destroying public property; striking the flag to an enemy or rebel; displaying cowardice, negligence, or disaffection in time of battle, or deserting his station or enticing others to do so; not properly observing the orders of his commanding officer when in command; neglecting, when an engagement is probable, or when an armed vessel of an enemy or rebel is in sight, to prepare and clear the ship for action, failing to encourage, in his own person his inferior officers and men to fight courageously; not doing the utmost possible to overtake and capture or destroy any vessel which it is his duty to encounter, and not affording all practicable relief and assistance to vessels belonging to the United States or their allies when engaged in battle, will also subject the offender to trial by a general court-martial. Courts-martial also have jurisdiction over the following: neglect on the part of a commanding officer to transmit to the Navy Department a list of officers and men entitled to share in prize money awarded for any capture; taking money, plate, goods, equipment, or stores of any kind from a prize before a lawful court has pronounced judgment; maltreating in any manner any person taken on board a prize, enlisting a deserter, an insane, or intoxicated person, or minor; acting contrary to the discipline of the navy upon being separated from a vessel by means of her wreck, loss, or destruction. When the proceedings of a general court have once begun they are not suspended or delayed as long as five of the members are present. No member of a general court-martial can, after the proceedings have once begun, absent himself on pain of being cashiered. Punishment must in all cases be adequate to the offense, but the members can recommend the person convicted as deserving of clemency. No sentence of a court-martial, extending to the loss of life or to the dismissal of a commissioned or warrant officer, can be carried into execution until confirmed by the President. All other sentences can be carried into execution on confirmation of the officer ordering the court, who has power to remit or mitigate, but not to commute a sentence.

COURTNEY, Leonard Henry, British statesman and author, b. in 1832 and graduated at Cambridge University in 1872; was called to the chair of political economy at University College, London. He was several times elected to Parliament and was Under Secretary of State for the Colonies, 1881; Governor of Madras, 1882; Privy Councillor 1889, and a member of various commissions, among them the Labour Commission, 1893-94. He has published many papers in prominent periodicals.

COURT OF LOVE, an outgrowth of the extreme romance of the age of chivalry. Such a court was to decide in matters of courtesy and etiquette, particularly in affairs where love was or might be concerned. It was composed of women of high birth and position. There was a code (still preserved) of 31 articles, in accordance with which decisions were made. Here is a specimen of the important questions passed upon: "A lady listened to one admirer, pressed the hand of another, and touched with her toe the foot of a third. Which of those three was the favored suitor?" To the great annoyance of mankind, the decision has never been known. Among the eminent presiding divinities of these courts were the countess de Die called the Sappho of her age, and Laura de Sade, who was celebrated by Petrarch. René, king of Anjou, and Richelieu, the great cardinal, made ineffectual efforts to resuscitate these courts. See Rowbotham, *The Troubadours and Courts of Love* (1895).

COURTOIS, Jacques and Guillaume, 1621-76, and 1628-79; brothers and painters, natives of France, and sons of a painter; both educated in Italy under Guido and other celebrated masters. Jacques excelled in battle pieces. Late in life he joined the Jesuits and took orders, but still continued his artistic work. Guillaume also excelled in battle pieces, adding thereto many religious compositions.

COURTRAI (Flemish, *Kortryk*), a t. of Belgium, in the province of West Flanders, about 30 m. s. of Bruges, lat. 50° 49′ n., long. 3° 18′ east. C., which is built on both sides of the Lys, is surrounded with walls, and has a castle, a citadel, a fine old bridge flanked with Flemish towers, a noble town-hall, and a beautiful Gothic church, founded in 1238 by Baldwin, count of Flanders. Though a busy manufacturing place, C. is nevertheless very clean. Table damask and other linen are the principal articles of manufacture. Pop. '95, 31,912. In 1302, the Flemings, citizens of Ghent and Bruges chiefly, won a splendid victory over the chivalry of France beneath the walls of C., more than 700 gilt spurs (worn only by French nobles) being afterwards gathered from the dead by the victors. The battle was hence named "the battle of the spurs."

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COURT OF SESSION, the highest civil tribunal in Scotland, was instituted in the reign of king James V., by statute dating 17th May, 1532. The object of its institution was to discharge the judicial functions which originally belonged to the king and his council, and which, since 1425, had in a great measure devolved on a committee of parliament, as the great council of the nation. The C. of S. consisted at first of 14 ordinary judges and a president. One half of these judges and the president were churchmen, and the practice of appointing ecclesiastics to the bench did not cease for some time even after the reformation. The king had the privilege of appointing, in addition to the ordinary judges, three or four peers or members of his great council, to sit and vote with the lords of session. When the lord chancellor (see CHANCELLOR OF SCOTLAND) was present, he was president of the session. His office was abolished at the union, and the habit of appointing peers gradually fell into disuse, though, when a peer chances to be present, he is still, as a mark of courtesy, accommodated with a seat on the bench. From its foundation, till 1808, the C. of S. consisted of one court; in that year it was divided into what are known as the first and second divisions, two separate courts possessing co-ordinate jurisdiction. The lord president is still president of the whole court when called together for consultation, and enjoys other privileges in that capacity; but on ordinary occasions he officiates simply as president of the first division. In 1810, another very important change was made. The first division up to this time had consisted of 7, and the second division of 6 ordinary judges, the latter being presided over by the lord justice-clerk (q.v.), as the former was by the lord president. The three junior judges were now taken from the first division, and the two junior judges from the second, and appointed to sit as permanent lords ordinary in the outer house. The quorum, which had formerly been four, was now reduced to three in both divisions. In 1830, the number of judges in the C. of S. was reduced to 13; and that is still the full number, though since 1877 there have actually been but 12 judges. Of the five lords ordinary, four only sit daily. The judgments of the outer house, with a few statutory exceptions, are appealable to the inner house. The youngest judge, or junior lord ordinary, officiates in a separate department of the outer house, called the bill chamber, where summary petitions, and other branches of business peculiarly requiring dispatch, are disposed of. This department alone is open during the vacations of the court, the judges, with the exception of the lord president and lord justice-clerk, officiating in it in rotation. Either division of the C. of S. may call in the aid of three judges of the other, when equally divided in opinion (31 and 32 Vict., cap. 100). In cases of still greater difficulty, the lords ordinary are also called in, and a hearing before the whole court, or *in presence*, as it is called, takes place. Since the 31 and the 32 Vict., cap. 100, no hearings before the whole court have taken place; the cases being decided in written arguments submitted to the judges. The judges of the C. of S. are appointed by the crown, and hold their offices for life. No one is eligible to the office unless he has served as an advocate or principal clerk of session for five, or as a writer to the signet for ten, years.

COURTS OF THE UNITED STATES. See JUDICIARY IN THE UNITED STATES.

COURT-YARD. An enclosed space surrounding or adjoining a building, or enclosed by the building itself.

COUSCOUS, or SPOTTED PHALANGER, a marsupial animal about the size of the domestic cat, black and white with brown spots. It has a prehensile tail. It is found in the Spice islands, and sought for both its fur and its flesh. It is sometimes called the *shamsham*.

COUSIN, VICTOR, the founder of systematic eclecticism in modern philosophy, was b. in Paris, Nov. 28, 1792. He studied with brilliant success at the *Lycée Charlemagne*. In 1812, he was appointed Greek tutor in the *Ecole Normale*, and, in 1814, examiner in philosopher. In the following year he became assistant-professor to Royer-Collard at the Sorbonne, and threw himself heartily into that reaction against the sensualistic philosophy and literature of the 18th century, which was then the order of the day. Following the path of his senior, he became an exponent of the doctrines of the Scotch metaphysicians, but exhibited far more brilliancy, energy, and warmth of expression than the original authors of these doctrines. In 1817, C. visited Germany, where he was introduced to bolder and more speculative systems of philosophy than any he had yet known. He studied successively, or at the same time, Plato, Kant, Jacobi, Fichte, and Schelling. A second visit to Germany, in 1824–25, had also important consequences. Suspected of carbonarism, he was arrested at Dresden by the police, and sent to Berlin, where he was detained for six months. He took advantage of his compulsory residence in the capital of Prussia to study the philosophy of Hegel, which exercised considerable influence on his susceptible intellect. On his return to France, he took a decided stand against the reactionary policy of Charles X.; and in 1827, when the comparatively liberal ministry of Martignac came into office, C., who had for some years been suspended from his professorial functions, was reinstated in his chair. Meanwhile, C. had appeared as an author. During 1820–27, he published his editions of Proclus and Descartes, and part of his celebrated translation of Plato, which was finished in 1840, in 13 vols. The

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year 1828 witnessed the most splendid triumph in the career of C. as a philosophic teacher. It is said that to find an audience as numerous, and as passionately interested in the topics discussed, as gathered round C., it would be necessary to go back to the days of Abelard and other medieval teachers of philosophy. C. was still young, simple, and pure in his habits; his doctrines were for the most part new to his hearers, bold, and in harmony with the spirit of the time. The finest qualities of the national genius appeared in his lectures, a wonderful lucidity of exposition, an exquisite beauty of style such as no modern or ancient philosopher, excepting Plato, has equaled; a brilliancy of generalization and criticism that enchanted every one; and a power of co-ordinating the facts of history and philosophy in such a manner as to make each illustrate the other, and reveal their most intricate relations. At this period, C. was one of the most influential leaders of opinion among the educated classes in Paris; and consequently, after the revolution of 1830, when his friend Guizot became prime-minister, C. was made a member of the council of public instruction; in 1832, a peer of France; and later, director of the *Ecole Normale*. His efforts for the organization of primary instruction are to be seen in those valuable reports which he drew up, from personal observation, on the state of public education in Germany and Holland. In 1840, he was elected a member of the *Académie des Sciences Morales et Politiques*, and in the same year became minister of public instruction in the cabinet of Thiers. The revolution of 1848 found in C. a friend rather than an enemy. He aided the government of Cavaignac, and published an anti-socialistic brochure, called *Justice et Charité*. After 1849, he disappeared from public life, and died in 1867.

It is more easy to state what philosophical doctrines have received exposition at the hands of C., than to determine precisely what are his own. At first a disciple of Royer-Collard and the Scotch school, he was attached to the psychological method of investigation; afterwards a keen student of the German school, he expounded the views of Schelling with such copious enthusiasm, that he might legitimately enough have been considered a thorough pantheist. Judging from such a book as *Du Vrai, du Beau, et du Bien* (1853), he seemed more disposed, latterly, to regard philosophy in its religious and æsthetic relations. See ECLECTICISM.

C.'s chief works (besides those already mentioned) are *Fragments Philosophiques* (1826); *Cours de l'Histoire de la Philosophie* (1827); *Ouvrages inédites d'Abelard* (1836); *Cours d'Histoire de la Philosophie Moderne* (1841); *Cours d'Histoire de la Philosophie Morale au XVII^e Siècle* (1840–41); *Leçons de Philosophie sur Kant* (1842); *Des Pensées de Pascal* (1842); *Etudes sur les Femmes et la Société du XVII^e Siècle*, etc. (1853). C. also contributed a great variety of papers to the literary and philosophic reviews of France.

COUSINS, FIRST. See MARRIAGE.

COUSTOU, NICOLAS, 1658–1733; son of a wood-carver of Lyons, who became rector and chancellor of the academy of painting and sculpture in Paris. He was remarkable as a painter. Some of his works are the "Union of the Seine and the Marne," the "Bergen Chasseur;" and the "Descent from the Cross," behind the choir of Notre Dame.

COUTANCES, a t. of France, in the department of La Manche, at the confluence of the Soulle and Bulsard. It is built on a conical hill, a few miles from the English channel, and is a somewhat lugubrious place. Its cathedral, however, is one of the finest structures of ecclesiastical architecture in the early pointed style in Normandy. One of the towers of the edifice is lighted up with a lantern, that serves as a beacon for ships navigating the channel. C. has manufactures of druggets, muslins, etc., and a trade in corn. Population, '91, 8145.

COUTHON, GEORGES, a fanatic of the French revolution, was b. in 1756 at Orsay, near Clermont, in Auvergne. At the outbreak of the revolution, he was engaged as an advocate, and in 1790 was elected president of the tribunal for the district of Clermont. In 1791, he was sent by his fellow-citizens to the national convention, where he made himself conspicuous by his furious hatred of the court, the priesthood, and the monarchy. In spite of an infirmity which prevented him using his limbs, C. soon became very influential from the rabid violence of his sentiments. He voted for the death of the king without delay or appeal to the country, and (after a brief relapse into moderatism) became a devoted and bloodthirsty partisan of Robespierre. In July, 1793, he was appointed a member of the *Comité de Salut Public*, and along with Châteauneuf-Randon and Maignet, was sent against the Lyonnese insurgents. After some opposition, the city was taken, when a multitude of the citizens were put to death. On his return to the convention, he became quite maniacal, demanding the "impeachment" of all the kings of the earth, and voting to declare Pitt "the enemy of the human race," and the English nation "a traitor to humanity." The fall of Robespierre brought down C. also. Accused by Fréron, he was thrown into prison, delivered by the mob with whom he was popular, recaptured by the soldiers of the convention, and executed 28th July, 1794, along with St. Just and Robespierre.

COUTRAS, a t. of France in the department of Gironde, situated on the left bank of the Dronne, about 26 m. n.e. of Bordeaux. C. has a considerable trade in flour, and the district produces red wine; but the place is known principally on account of the

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bloody victory gained here, 1587, by Henry of Navarre over the forces of the league. In this battle the duc de Joyeuse, commander of the leaguers, was slain, as well as many other great noblemen on the same side. Pop. of commune, '91, 4231.

COUTTS. See BURDETT-COUTTS.

COUTURE, THOMAS, b. 1815; a French painter, pupil of Delaroche. His first noteworthy work was "The Love of Gold." In 1847, he greatly enhanced his reputation by the "Romans of the Decadence," which secured for him the cross of the legion of honor. Couture taught many pupils, and has had great influence over contemporary art. He wrote several books on art topics. He d. 1879.

COUVADE. A name given to a curious custom found among various savage tribes both in the New World and in the Old, by which, after the birth of an infant, the *father* is put to bed and carefully nursed for several days. See Von den Steinen, *Unter den Naturvölkern Zentral-Brasiliens* (Berlin, 1894).

COVENANT, in English law, an agreement by *deed* (q.v.). In the common law-courts, a special form of action is appropriated to the enforcement of a C. called an action of covenant.

It may be added that in law there is a great variety of covenants, for almost any agreement may fall under that designation. There are affirmative covenants; covenants against incumbrances; alternative, auxiliary, collateral, concurrent, declaratory, dependent, disjunctive, executed, executory, and express covenants; also, covenants for further assistance; covenants for quiet enjoyment; covenants for title; implied covenants; covenants in deed and in law; illegal covenants; independent covenants; and inherent, intransitive, joint, negative, and obligatory covenants; also, covenants of right to convey; of seisin, of warranty, and personal covenants.

COVENANT (Lat. *convenire*, to come together), a contract or agreement; a term much used by theologians, and in its ordinary signification, as well as in its theological use, nearly if not always exactly equivalent to the Hebrew *berith* of the Old Testament and the Greek *diathēkē* of the New. Applied to relations established between God and men, the term C. must be understood with a certain modification of the meaning which it bears when employed concerning the relations of men to one another, when two independent parties enter into a C., which they have equal right to make or to refuse to make; and is sometimes employed as equivalent to *dispensation*, and the Jewish dispensation is called the *Old C.* (or *testament*, by another translation of *diathēkē*), in contradistinction to the Christian, which is called the *New*. God, in his supremacy, is regarded as appointing certain conditions for his creatures, which they cannot but accept, yet their willing consent to these conditions gives to the relation established the nature of a C.; and thus God is commonly said to have made two covenants with man: the *first C.*, or *C. of works*, with Adam, as the representative of the whole human race, promising life (with perfect happiness), upon condition of perfect obedience, whilst death was threatened as the penalty of transgression; the *second C.*, or *C. of grace*, being that on which depend the whole hope and salvation of man, since the first C. was broken, and in which life is freely offered to sinners, and they are simply required to believe in Jesus Christ that they may be saved. This C. God is regarded as having made with Christ, as the representative of his people, and with them in him. The older theologians often speak of the *C. of redemption* between God and Christ, employing the term *C. of grace* rather to designate the whole dealings of God with men in giving effect to the C. of redemption; but the term *C. of grace* has long been almost universally employed to include all that was comprehended under both terms. The *Abrahamic C.* is the C. of grace as declared to Abraham, in its particular relation to him and his seed. God is represented in Scripture as sustaining a *C. relation* to his *own people*, to the Jews under the old C., to believers in Christ under the new; and doctrinal theology consists not a little in tracing out the nature of this relation, and the consequences which flow from it. As the people of God collectively sustain a C. relation to him, so do believers individually; and it has not been an uncommon thing for pious persons to endeaver to reduce to writing their sense of this "*C. obligation*," under the notion of a *personal covenanting* with God; and of binding themselves by a stronger obligation to what they believed to be good and their duty. It has also been common for men, from the earliest ages, to enter into covenants with one another with more or less of religious solemnity; and this has in particular been done among those who have suffered persecution, or have been engaged in contests concerning matters of religion, for which the authority of certain passages of the Old Testament is strongly pleaded. Instances occur in the history of the Waldenses, and of some of the reformed churches, particularly in the history of the reformation in Scotland. See FEDERAL THEOLOGY.

COVENANTERS. See CAMERONIANS, and COVENANTS, and REFORMED PRESBYTERIANS.

COVENANTS, THE, known in Scottish history and tradition, are chiefly two in number—the NATIONAL COVENANT and the SOLEMN LEAGUE AND COVENANT. As it is necessary to discriminate between these, we shall speak of them separately.

NATIONAL COVENANT.—This was a bond of union or agreement, drawn up at Edinburgh in 1638, by the leading Presbyterian ministers, and subscribed by vast numbers

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of persons of all ranks of life. It embodied the confession of faith of 1580 and 1581, subscribed by James VI. in his youth, and again recognized in 1590 and 1596; and was binding on all who signed it to spare nothing which might save their religion. The proximate cause of this extraordinary manifestation of feeling was the attempt of Charles I. to enforce Episcopacy and the use of the service-book in Scotland. The subscribing of the national covenant began on the 28th of Feb., 1638, in the Greyfriars' church and church-yard, at Edinburgh. Numerous copies were also circulated through the country for signature—a circumstance which accounts for many copies being still extant. "In the library of the faculty of advocates at Edinburgh are preserved five parchment copies, with the original signatures of Rothes, Montrose, Loudon, and many others of the nobility, gentry, commissioners of counties and burghs, and ministers, though only one of these five copies is apparently connected with the first signing, and the other four, which are dated 1639, were subscribed after the ratification by the general assembly."—*Historical Sketch Illustrative of the National Confession of Faith* (Davidson, Edinburgh, 1849), to which we refer for a variety of details. The general assembly, which met at Glasgow, Nov. 21, 1638, ratified the national covenant and the confession of faith which it embraced, and deposed the whole of the hierarchy which had been established by Charles I. The national covenant was subsequently ratified by the 5th act of the second parliament of Charles I., held at Edinburgh June 11, 1640, and subscribed by Charles II. at Spey, June 23, 1650, and Scoon, Jan. 1, 1651. The document will be found in the volume which comprehends the *Westminster Confession of Faith*, in use by the church of Scotland. Those who subscribe the national covenant, promise to "continue in obedience of the doctrine and discipline of this kirk." They also give assent to various acts of parliament in the reign of James VI., which besides repudiating the jurisdiction of the pope, and all the ceremonial observances and errors of the Romish church, ordain "all sayers, wilful hearers, and concealers of the mass, the maintainers and resettors of the priests, Jesuits, trafficking Papists, to be punished without any exception or restriction."

Solemn League and Covenant.—This was a document of date four to five years later than the national covenant, since the signing of which, Charles I. had broken with the English parliament, set up his standard at Nottingham (Aug., 1642), and from his various successes, it was thought he might finally be able to reinstate Episcopacy in Scotland. With some alarm on this ground, the Scotch willingly received overtures from commissioners deputed from the English parliament. Hopes were held out to the Scottish nation, that in the event of success against the king, the Presbyterian model should supersede the Episcopalian both in England and Ireland. Approving of a measure of this kind, the Scottish estates entered into what was called a solemn league and covenant with the English parliament. One of the provisions of the bond of agreement was, that the Scotch should send an army into England against the king, which they did in Jan., 1644.

The solemn league and covenant was subscribed by many of all ranks in Scotland and England, including the assembly of divines at Westminster, was ratified by the general assembly at Edinburgh, Aug. 17, 1643, and the Scottish parliament, July 15, 1644; and subscribed by Charles II. at Spey, 1650, and Scoon, 1651. Like the national covenant, it has, till the present day, a place in the volume which comprehends the *Westminster Confession of Faith* of the church of Scotland. While the national covenant refers to the observance of the Presbyterian polity within Scotland alone, the solemn league and covenant is much more comprehensive. Those who subscribe it, setting out with a profession of attachment to the church of Scotland, are to endeavor to bring about a uniformity in religion and church-discipline in the three kingdoms; and further—"That we shall in like manner, without respect of persons, endeavor the extirpation of popery, prelacy (that is, church-government by archbishops, bishops, their chancellors, and commissaries, deans, deans and chapters, archdeacons, and all other ecclesiastical officers depending on that hierarchy), superstition, heresy, schism, profaneness, and whatsoever shall be found to be contrary to sound doctrine and the power of godliness, lest we partake in other men's sins, and thereby be in danger to receive of their plagues; and that the Lord may be one, and his name one, in the three kingdoms."

Such were the famous C., at one time enforced by civil penalties, and for which their adherents, under the name of covenanters, fought and suffered in Scotland, between the restoration and revolution, maintaining to the last that both C., notwithstanding certain recissory acts of parliament, were still binding on the whole nation. At the revolution, the two C. were set aside, and cannot be said to have now any practical effect in any part of the United Kingdom. As above stated, they have a place in the volume which comprehends the *Westminster Confession of Faith*, but for what reason, it is difficult to say; for the church of Scotland does not make adherence to them obligatory on either clerical or lay members. Certain Scottish and Irish dissenters, however, still profess attachment to the C., and on particular occasions renew their subscription of them. See Cameronians. The obligations undertaken by the sovereign, and the modern acts of parliament abolishing religious tests on taking civil office, and admitting Roman Catholics, Non-conformists, and Jews to parliament, not to speak of public opinion, are totally at variance with the covenants. It is customary in popular

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lectures on the covenanters to overlook the fact, in compassion for their sufferings, that they contended for what is now quite adverse to the principles of religious toleration. Yet, in so far as the manful struggle in which they were concerned helped to accelerate the revolution, the history of the covenanters must ever be associated with that of civil and religious liberty.

COVENT GARDEN (properly *Convent Garden*, from having been originally the garden of Westminster Abbey) is a square in London celebrated for its great market of fruit, vegetables, and flowers. In the 17th c., C. G. was a very fashionable quarter of the town—the residence of many eminent persons. The scene of one of Dryden's plays is laid here, and frequent allusions are made to the place in plays of Charles II.'s time. The market, now so famous, appears to have originated about 1656 in a few wooden sheds and stalls. C. G. is for a stranger one of the sights of London, and is seen to greatest advantage about three o'clock on a summer morning; Tuesday, Thursday, and Saturday being the principal days.

COVENTRY, a town in Kent co., R. I., on the Pawtuxet river and the New England railroad; taken from Warwick and incorporated in 1741; pop. 1890, 5068. The main business is the manufacture of cotton goods, mousseline-de-laine, and machinery.

COVENTRY (Convent Town), a city, parliamentary and municipal borough, and manufacturing town in the north of Warwickshire, on the Sherbourne, an affluent of the Avon, 18½ m. e.s.e. of Birmingham. It stands on a gentle eminence in a valley, with a ridge of hills on the s., and contains many old houses, with timbered fronts, projecting into narrow streets, and belonging to the 15th and 16th centuries. The modern part of C., however, is well, though not regularly, built. The chief buildings are the churches, with imposing spires. St. Michael's church, built 1313–95, is said to be the largest parish church in England, and is one of the noblest of the lighter Gothic structures. St. Mary's hall, built 1450, for the Guild, is one of the finest specimens of ornamental work in England, with grotesque carved oak roof, ancient tapestry, and great painted window. In the market-place formerly stood a rich hexagonal Gothic cross, 57 ft. high, erected in the 16th c., in three stories, with exquisitely finished pillars, pinnacles, and niches, with statues of English kings and saints. Before the year 1760 the cross had fallen to decay, and in 1771 the remains of it were taken down and removed. The ancient walls, three miles in circuit round C., were demolished by Charles II. Pop. '91, of municipal borough, 52,720. C. returns two members to parliament. The chief manufactures are ribbons, watches, fringes, etc., and it is an important seat of the manufacture of bicycles and tricycles, which are said to have been first made here. C. is nearly in the center, between the four great English ports, London, Bristol, Liverpool, and Hull, and has extensive canal communication with other parts of the country. It is a very ancient place. In 1044, earl Leofric and his wife, lady Godiva, founded here a magnificent Benedictine monastery. In memory of Godiva (q.v.), who is said to have ridden round the town naked, to free it from certain imposts laid on by her husband, curious and splendid processions were formerly held in C. In the 15th c., religious mysteries or plays were often acted here by the gray friars before kings. Henry VIII. demolished the beautiful cathedral of C. Here occurred the famous meeting for the intended trial by battle between the dukes of Norfolk and Hereford, immortalized in Shakespeare's *Richard II.* Two memorable parliaments were also held in the monastery of C. in the 15th century. The one contained no lawyers, while the other passed many attainders against the duke of York, etc. In the 15th, 16th, and 17th centuries, C. was famous for woolens, broadcloths, caps, and blue thread bonnets. The Lammas land lying around C., and comprising about 1100 acres, was divided between the proprietors and the freemen, numbering about 4,000, in the proportion of about two-thirds to the former, and one-third to the latter. C. was visited by the plague six times between 1350 and 1625. The phrase, "to send to Coventry," took its rise most probably from the derivation of the name C., and meant "to send to a convent," i. e., to shut out from society.

COVENTRY, Sir JOHN, has obtained a niche in English history from accidental circumstances. In the month of Oct., 1670, he rose in parliament and asked a question relative to a measure before the House, which was taken as an unwarrantable reflection on the king's amours. Charles was furious, and sent some of his guards to watch in the street where C. lived, and leave a mark upon him. C. was attacked one night, and had his nose cut to the bone. Parliament took notice of this atrocious outrage, and passed a bill known by the name of the COVENTRY ACT, making cutting and maiming a capital offence; but they had not courage sufficient to bring the king's bravoes to trial.

COVERDALE, MILES, an eminent English divine, was b. in Yorkshire in 1488. He was educated at Cambridge by the Augustin friars, and becoming an Augustin monk, was ordained at Norwich. He appears, however, to have soon changed his religious opinions, and to have devoted himself earnestly to the work of the reformation. Being abroad in 1532, he assisted Tyndale with his translation of the Scriptures, and three years afterwards appeared his own translation of the Bible, with a dedication by himself to Henry VIII. This was the first English Bible sanctioned by royal authority, as, indeed, it was the first complete translation of the Bible printed in the English language.

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The psalms of this translation are those still used in the book of common prayer. In 1538, C., with the consent of king Henry VIII., and with the permission of Francis I., went to Paris to superintend another English edition of the Scriptures, his reason for going to Paris being that paper and workmanship were there cheaper and better than in England. The inquisition, however, notwithstanding the royal license of Francis, interfered, seized the whole impression, consisting of 2,500 copies, and condemned them to the flames. But through the cupidity of one of their executive officers, who sold a considerable number of the heretical books to a haberdasher as waste paper, some copies were saved and brought to London along with the presses, types, etc., which had been employed in printing them. Several of the workmen also came over to London; and Grafton and Whitchurch, the noted printers of that day, were thus enabled to bring out in 1539, under C.'s superintendence, the *Great Bible*, commonly called *Cranmer's Bible*, on account of that prelate having written a preface to it. In 1551, C. was appointed to the see of Exeter, the duties of which high ecclesiastical office he discharged with great zeal, until the accession of Mary in 1553, when he was ejected, and thrown into prison, from which he was only released after two years' confinement, on the earnest intercession of the king of Denmark, whose interest was evoked by his chaplain, C.'s brother-in-law, and on the condition that he should leave the country. C. went to Denmark, and subsequently to Geneva, where he assisted in producing the *Geneva Translation* of the Scriptures (1557–60). On the accession of Elizabeth, he returned to England, but certain notions concerning ecclesiastical ceremonies imbibed at Geneva operated against his preferment in the church; and it was not until 1564 that he was collated to the rectory of St. Magnus, London. Owing to age and infirmities, he resigned this living in 1566, and died in about two years afterwards. C. was the author of several tracts designed to promote the reformation, and made various translations from the works of the continental reformers. The tri-centenary of the issue of his Bible was celebrated in 1835.

COVERLY, Sir Roger de, a popular dance-tune of England. Its author and the date of its composition are unknown, but the editor of the Skene ms. claims the tune as Scotch, on the authority of a ms. dated 1706, and says that north of the Tweed it is known as the "Mautman comes on Monday." The tune is variously called "Old Roger of Coverly for evermore, a Lancashire Hornpipe;" "Roger of Coverly;" "Roger a Coverly," in Gay's opera *Polly;* "Roger de Coverly," in *Robin Hood;* and "Sir Roger de Coverly," in Fielding's *Tom Jones*. A song, "O Brave Roger de Coverly," is contained in *Pills to Purge Melancholy*. The dance is an old-fashioned country-dance (or contredanse), and is known in this country as the "Virginia Reel." Addison took the name for his Sir Roger de Coverly in the *Spectator*.

COVINGTON, a co. in s. Alabama, on the Florida border, drained by Yellowwater and Conecuh rivers; 994 sq. m.; pop. '90, 7536, includ. colored. Co. seat, Andalusia.

COVINGTON, a co. in s. Mississippi, watered by the tributaries of Leaf river; 570 sq. m.; pop. '90, 8299, includ. colored. Co. seat, Williamsburg.

COVINGTON, city and co. seat of Kenton co., Ky., at the junction of the Ohio and Licking rivers, opposite to Cincinnati, of which it is practically a suburb, being connected by two bridges, one a wire suspension bridge, 2252 ft. long, built at cost of $1,800,000. Another bridge connects with Newport, Ky. It is entered by the Louisville and Nashville and Chesapeake and Ohio railroads, and electric railroads connect with Cincinnati, Dayton, Bellevue, Ludlow, Bromley, Fort Thomas, and Newport. Covington, which was settled in 1812, laid out in 1815, and incorporated as a city in 1834, occupies a beautiful plain, and resembles Cincinnati in its general arrangement. It has beautiful fair grounds, many handsome private residences, a fine court-house and city hall, post-office and United States building, library, Western Theological College, a Roman Catholic cathedral, handsome churches, a German orphan asylum, a Benedictine priory, a convent, a Roman Catholic hospital and foundling asylum, public schools enrolling many pupils, Covington Educational Institute, Notre Dame Academy, and Rugby preparatory school. There are several banks, newspapers, and a system of waterworks. The packing of pork and beef is an important industry, together with the manufacture of tobacco and cigars, iron, carriages and wagons, liquors, glass, etc. Population, '80, 29,720; '90, 37,371.

COW. See Ox, Dairy.

COW-BIRD, or Cow-Bunting. See Cow-pen Bird.

COWBOY, the name applied to a robber usually of cattle, sometimes of property, infesting the roads east of the Hudson river between the British and American lines. They professed to be Tories. A similar band, professing to be Whigs, called Skinners, plundered wayfarers at same period and in same places. See Cooper's *Spy*.

COWBOYS, the name given to the mounted herdsmen hired by the owners of stock in the Rocky mountain regions to look after their cattle. In the great herding districts of the west, where cattle are mostly fattened on public domain and roam over vast areas without fences or roads, and with only scattered and irregular places for water and shelter, the cowboys hold an important place. It is their business to keep the cattle together, to guide them to pasture, to prevent their being mixed with other droves, to protect them from Indian and other thieves, to brand them at the proper seasons, and to drive them to market when they are ready for slaughter.

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COW'AGE, COW'HAGE, or **COW'ITCH,** consists of short, slender, brittle hairs, which grow on the outside of the pods of plants of the genus *mucuna*, natives of the tropical parts of America and Asia. The genus belongs to the natural order *leguminosæ*, sub-order *papilionaceæ*, and has a knotted, two-valved pod, divided by transverse partitions. The species are twining plants, shrubby or herbaceous, with leaves of three leaflets. That which yields most of the C. brought to Europe is *M. pruriens*, a native of the West Indies, with racemes of fine purple flowers, which have a disagreeable alliaceous smell, and pods about 4 in. long. *M. prurita* of the East Indies, and *M. urens*, the ox-eye bean of the West Indies, yield C. of similar quality. The hairs readily stick in the skin, and cause intolerable itching. C. is used in medicine, acting mechanically in killing and expelling worms, particularly the species of *ascaris* (q. v.). That it does not act on the inner surface of the intestinal canal, is supposed to be owing to the mucous secretion. It is generally administered in syrup, treacle, or honey.—Before the pods of C. plants are ripe, they are used as a vegetable, like kidney beans, and are very palatable.

COW CATCHER is a strong iron framework placed at the front of a railroad locomotive for the purpose of catching or throwing obstructions from the track. It is only in the U. S. that they are used.

COWELL, EDWARD BYLES, was b. England, 1826; was educated at Oxford. He went to Calcutta in 1856, where he was professor of history in the Presidency college, and later principal of the Sanskrit college. In 1867 he was made professor of Sanskrit in the university of Cambridge. He published *The Prâkrit Grammar of Vararuci* (1854), etc., and edited with notes Elphinstone's *History of India* (1866).

COWES, WEST, a seaport and watering-place in the n. corner of the isle of Wight, on the w. side of the mouth of the estuary of the Medina (here a third of a mile broad). It stands on a hill slope, and has a striking aspect from the sea. There are many elegant villas in the vicinity. C. has much trade, being the port of the isle of Wight. It has daily steam communication with Southampton, from which it lies 10½ m. to the s.s.e., and with Portsmouth, from which it lies 8¼ m. to the w.s.w. At the angle formed by the Medina and the sea, is a small battery built by Henry VIII. C. is the head-quarters of the royal yacht squadron and club, who hold their annual regatta here. It is the principal port of the isle of Wight and has a considerable coasting trade. Pop. '91, 7768.—EAST COWES is situated on the e. side of the mouth of the Medina, and 2 m. n.w. of Osborne house, the marine residence of queen Victoria. Pop. '91, about 3000.

COWETA, a co. in n.w. Georgia, intersected by the Atlanta and West Point, and the Georgia Central railroads, and bounded on the n.w. by the Chattahoochee; 506 sq. m.; pop. '90, 22,354, including colored. The surface is even and the soil fertile, producing corn, wheat, cotton, etc. Co. seat, Newnan.

COWL, a hood generally attached to a loose cloak and worn on the head. It was common in England in the middle ages, but has come to be used chiefly by monks or members of some religious order, such as the Benedictines and Franciscans.

COWLEY, a co. in s.e. Kansas, bordering on the Indian territory, bounded on the w. by the Arkansas river; 1122 sq.m.; pop. '90, 84,478. Agriculture is the chief business. Co. seat, Winfield.

COWLEY, ABRAHAM, was b. in London in 1618. He was the son of a grocer, and was educated at Westminster school and Trinity college, Cambridge. According to his own statement, he was made a poet by the perusal of Spenser, whose works were wont to lie in his mother's parlor. A volume of poems, entitled *Poetic Blossoms*, was published by him at the age of 15, and one of the pieces contained therein was written when he was 10 years old. At Cambridge he obtained distinction through the elegance of his translations; and while there, he composed the greater part of the *Davideis*, an epic in four books—a work which he never completed. He was attached to the court party, and, in consequence, was ejected from his college in 1643, after he had taken his degree of M.A. In 1646, he followed the queen to Paris, in which city he remained 10 years; and on his return to England, being under suspicion, he was seized and bound in heavy securities for his future behavior. In the same year, he published an edition of his poems, with a preface, in which certain passages appeared, supposed to have a political bearing, which were suppressed in subsequent editions. After the restoration, he expected to obtain the mastership of the Savoy, but was disappointed. He subsequently obtained a lease of the queen's lands at Chertsey, in Surrey, whither he retired in 1665. He died in July, 1667, in his 49th year, and was buried in Westminster abbey, near Chaucer and Spenser. In 1675, a monument was erected to his memory by the duke of Buckingham.

Although almost forgotten now, the time was when C.'s poetry was considered equal to Shakespeare's or Spenser's. It certainly possesses merits of ingenuity and verbal brilliancy. He is often splendid, but it is the splendor of the rocket rather than of the glowworm or the star. His prose is more natural than his verse, and some of its passages reach a stately eloquence, reminding the reader of the magnificent prose of Milton.

COWLEY, HENRY RICHARD WELLESLEY, first earl (his father being first baron Cowley, better known as sir Henry Wellesley), an English diplomatist of liberal opinions, was b. in 1804. He early devoted himself to diplomatic pursuits. An attaché at Vienna in 1824, he was afterwards successively promoted to be secretary to the legation at Stutt-

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gart, and to the embassy at Constantinople. Having acted as minister-plenipotentiary to Switzerland, and afterwards to Frankfurt, he was (1851) appointed minister to the Germanic confederation, and in the following year he succeeded the marquis of Normanby as ambassador at Paris. For this position he displayed eminent qualifications, and held the appointment whether his party was in or out of office till 1867, when he resigned. Along with the earl of Clarendon he represented Great Britain at the Paris congress of 1856; and it was greatly owing to his tact and temper that ill-feeling between the two countries did not result in more serious disagreement. He was created viscount Dangan and earl Cowley in 1857, and made a K.G. in 1865. He d. 1884.

COWLITZ, a co. in s.w. Washington, situated on the Columbia river, which separates it from Oregon; 1124 sq.m.; pop. '90, 5917. It is mountainous but fertile, and as yet little settled. Co. seat, Kalama.

COW PARSNIP, *Heracleum*, a genus of plants of the natural order *umbelliferæ*, having petals bent in at the middle, and flat compressed fruit. One species only is a native of Britain, the common C. P. or HOG-WEED, called *kiesh* in Scotland; a common and rank weed, with coarsely hairy leaves, and stem about 3 to 5 ft. high. It is gathered in some parts of England for fattening hogs, and is said to afford wholesome food for cattle. Some Siberian species are much larger, and have been recommended for cultivation on account of the great quantity of herbage which they yield very early in the season, particularly *H. panaces*, which sometimes attains a height of 10 ft., and the root leaves are 3 to 5 ft. long.

COW-PEN BIRD, *Molothrus pecoris*, also called cow bird, cow troopial, cow blackbird, cow bunting, etc., a bird nearly allied to the Baltimore birds and troopials, having a short, conical beak, and remarkable for its habit of depositing its eggs, like the cuckoo, in the nests of other birds. It is a native of North America, common in some of the southern states in winter, and migrating northward in spring. Great flocks are sometimes seen together. The cow-pen bird is about 7 in. in entire length, of glossy brownish black plumage. It derives its name from its frequenting cow-pens, to feed on the insects contained in, or attracted by the dung. It selects for the reception of its eggs the nests of birds smaller than itself, and by an interesting provision of nature, its egg, which is not much larger than theirs, is hatched sooner, and theirs appear to be generally removed as addled eggs.

COWPENS, a town in Spartanberg co., S. C., near the n. border of the state. The place is noted chiefly for a battle there Jan. 17, 1781, between the British under Col. Tarleton and the Americans led by Gen. Morgan, in which the former were defeated, losing 300 killed and wounded and 500 prisoners. The Americans had only 12 killed and 60 wounded. Pop. '90, 349.

COWPER, WILLIAM, Earl, 1664–1723; an English lawyer and judge, member of parliament, and lord keeper of the great seal. In 1706, he was made a peer, and was one of the commissioners to negotiate the union of Scotland with England. In 1707, he was lord chancellor; in 1716, lord high steward; and earl in 1718.

COWPER, WILLIAM, an English poet, was b. on the 26th Nov., 1731, in the parsonage house of great Berkhamstead. His father, who was chaplain to George II., married Ann, daughter of Roger Donne, esq., of Ludham hall, in Norfolk. This lady expired in childbirth, in 1737, leaving two sons, William, the poet, and John. This event made a deep impression on C.'s mind; and the lines addressed to his mother's portrait have drawn more tears than any other poem in the English language.

C. was a delicate and sensitive child, and boyhood brought with it only deeper melancholy and depression. At the age of six he was placed at a considerable school, kept by a Dr. Pitman, in Market street, Hertfordshire. The period he spent here was very miserable, and laid the foundation of that settled gloom which oppressed him till death. It is to the remembrance of these wretched days that we are indebted for the fierce invective that burns in the somewhat one-sided *Tirocinium, or a Review of Schools*. C. completed his studies at Westminster school, and shortly after was articled to a Mr. Chapman, an attorney in London.

After completing his three years' articles with Mr. Chapman, C. went, in 1752, to reside in the Middle Temple. In 1754, he was called to the bar, but never practiced. His father died in 1756, and left him a small patrimony. In 1759, he removed to the Inner Temple; and, although at this period he expected to secure some legal appointment through the influence of his family, he hated law with a perfect hatred, and seldom opened a book that bore on his profession. Yet he was industrious enough; he scribbled poetry, read Homer, and, in conjunction with his brother, translated some of the books of the *Henriade*. Soon after his settlement in the Inner Temple, he was appointed a commissioner of bankrupts; but there is no reason to believe that he ever entered on the duties of his office. An influential relative now offered him the office of clerk of the journals of the house of lords, which was accepted; but he, having to undergo an examination at the bar of the house, was seized with nervousness, and could not appear. At this period his misery was so great, that he meditated suicide, but fortunately failed to carry out his intentions for want of courage. In Dec., 1763, he was removed to the house of Dr. Cotton at St. Albans—a prey to the deepest remorse.

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C.'s pecuniary means had suffered considerably by the loss of his appointments, but his friends contrived to make up an income sufficient for his wants. After his removal from St. Albans, he went to reside in the town of Huntingdon. Here he formed acquaintance with Mrs. Unwin, the Mary of his poems—an acquaintance which ripened into the deepest friendship, and which subsisted till death. He went to reside with the Unwins, and enjoyed much tranquil happiness under that religious roof. When on a visit, in Jan., 1773, to, the Rev. Mr. Newton, a friend of the Unwins, and a man of sincere piety, but, from the peculiar cast of his religious views, perhaps not the best physician "to minister to a mind diseased," his malady returned. Mrs. Unwin carefully tended him through the crisis of his delirium, and through his long and slow recovery. When convalescent, he betook himself to writing hymns along with Mr. Newton, and to domesticating hares, with the particulars and little incidents of which amusement the world is pleasantly familiar. Mrs. Unwin also suggested, as a subject suited to his genius, *The Progress of Error*. C. set to work in Dec., 1780, and by the following Mar. had completed *Truth*, *Table-Talk*, *The Progress of Error*, and *Expostulation*. Although the volume was completed in 1781, its publication was delayed till the following year.

In 1781, C. made the acquaintance of Lady Austen, who suggested to him *The Task*, urged him to translate *Homer*, and—what the world is perhaps still more grateful for—she related to him the history of John Gilpin. The story so seized C.'s fancy, that in the course of a single night he produced the poem which has tickled the midriffs of three generations. *The Task* was begun in the winter of 1783, and published in 1785. Its success was great, and C. began to be considered the greatest poet of his day. In 1784, he began the translation of Homer, which appeared in 1791. It was received with great applause. He had labored hard, and had now to pay the penalty. The pen was the only weapon with which he could keep his constitutional malady at bay; but now, when seated at his desk, his genius would not answer the call. He began to hear again the voices and the whisperings which had afflicted him in earlier days. Mrs. Unwin's faculties also became affected, and the two friends were groping in the same twilight, deepening for both into the darkness of death. They left Olney, and were received into the house of Mr. Johnson, in Tuddenham, in Norfolk. Here Mrs. Unwin died on the 17th Dec., 1796. C. now fell into a state of utter dejection; in 1799, he was attacked by dropsy. He died on the 27th April, 1800.

C. was a great innovator in English literature; he destroyed the sentimentalists led by Hayley, and the image-hunters headed by Darwin. His poetry is eminently healthy, natural, and unaffected. C. and Robert Burns we have to thank for bringing back nature to English poetry. Besides being a poet, C. was perhaps the most delightful letter-writer in the English language. Nothing can surpass the charm of his epistles—full of fun, gentle sarcasm, anecdote, acute remark, and a tender shadow of melancholy thrown over and toning down the whole. The best edition of C.'s works (accompanied by an admirable biography) is that of Southey, 15 vols. 12mo, Lond. 1837-38.

COWPER'S GLANDS, two small yellow lobulated glands in man under the membraneous portion of the urethra. They secrete a mucus which flows into the bulb of the urethra. In woman, the vulvo-vaginal glands are analogous.

COW PLANT, *Gymnema lactiferum*, a perennial plant of the natural order *asclepiadaceæ*, a native of Ceylon; with erect stem, ovate leaves, and very short umbels; which has acquired a factitious celebrity from the statement made and often repeated that its milky juice is used as a substitute for milk, and that its leaves are boiled to supply the want of cream.

COW-POX. See SMALL-POX: VACCINATION.

COWRY, *Cypræa*, a genus of gasteropodous mollusks of the order *pectinibranchiata*—the type of a family, *cypræidæ*, to all of which the name C. is often extended—having the margin of the mantle prolonged into a siphon, by which water is conveyed into the gill chamber, and a spiral convoluted shell, the spire visible in the young, but entirely concealed in the adult, and the outer lip then thickened and bent in. The aperture extends the whole length of the shell. The shells, called *porcelain shells* by the French and Germans, are almost entirely calcareous in their composition, are richly enameled, and often very beautiful. They are most abundant and attain their largest size in the seas of warm climates. Only a few very small species are found on the British coasts. Some of the species are much prized by collectors of shells. The money C. (*C. moneta*) is of commercial interest, for its general use as a substitute for coin in many parts of Asia and Africa. It is not of great beauty, is yellow or white, often with a yellow ring, about an inch long, and nearly as broad as long. It is found on the Indian coasts, and in particular abundance on those of the Maldive islands, and is one of their principal exports. In Bengal, 3,200 cowries are reckoned equal to a rupee, so that a C. is about equal in value to one thirty-sixth of a farthing. Yet cowries to the value of 200,000 rupees are said to have been at one time imported annually into Bengal. Many tons of cowries are annually imported into Britain, to be used in trade with the w. of Africa, and this importation began when it was in the slave-trade that they were employed.—To the family *cypræidæ* belong the shells called *poached eggs* (*ovulum*), the *weaver's shuttle shell* (*ovulum volva*), remarkable for its prolongation at both ends, etc. Fossils of this family are numerous in some strata, as in the *bagshot beds* (q.v.).

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COWSLIP (*primula veris;* see PRIMROSE), a common native of pastures in England and many other parts of Europe, although rare in Scotland, a delicate and modest little flower, a universal favorite, both for its beauty and its fragrance. The flowers are small, in an umbel at the top of the scape, the limb of the corolla short and concave. The flowers have sedative properties, and are sometimes used as an anodyne and anti-spasmodic. They are fermented with sugar to make *cowslip wine*, an agreeable and favorite soporific domestic medicine.—The name VIRGINIAN COWSLIP is given to the *dodecatheon meadia*, a perennial plant, also of the natural order *primulaceæ*, a native of North America, with a stalk about 8 in. high, bearing an umbel of gracefully pendent lilac flowers, the petals reflexed over the calyx, the stamens and pistil long, and the anthers of a golden color. It is very ornamental in the flower-border.

COW TREE, a name given to a number of species of tree of different natural orders, the bland milky juice of which is used instead of milk. They are all natives of tropical countries, and mostly belong to natural orders in which acridity is the general characteristic of the milky juice. Some of them belong to the natural order *moraceæ*, and are closely allied to fig; others to the natural order *artocarpaceæ*, one of which is the famous PALO DE VACA or C. T. of the Cordilleras and Caracas (*galactodendron utile*, now rather referred to the genus *brosimum*, see BREAD-NUT). Another is the HYA-HYA (*tabernæmontana utilis*), a native of equatorial America, belonging to the natural order *apocynaceæ*.

The PALO DE VACA grows in rocky situations, at an elevation in equatorial regions of about 3,000 feet. It is a lofty tree, with laurel-like leaves, 10 to 16 in. long, and very small flowers. For several months in the year not a shower moistens its foliage, and its branches appear dead; but as soon as the trunk is pierced, there flows from it a copious stream of sweet and nourishing milk.

COW-WHEAT, *Melampyrum*, a genus of plants of the natural order *scrophulariaceæ*, having an oblong two-celled capsule, with a few seeds somewhat resembling grains of wheat. The species are natives of the temperate parts of the northern hemisphere, annual plants with opposite narrow leaves and yellow flowers.

COX, Sir GEORGE WILLIAM, b. Benares, India, 1827; went to England when eight years old, studied at Rugby and at Oxford, took orders in the church, and was appointed curate of Salcombe Regis, near Sidmouth. He is well known as a leading exponent of the sun-myth theory in comparative mythology, in defense of which he has written numerous books and magazine articles. His most important work is the *Mythology of the Aryan Nations*, 1870. He was joint editor with Prof. Brande of the *Dictionary of Science, Literature and Art*, 1864–66. In 1891 he was chosen bishop of Natal by the friends of Bishop Colenso (q. v.), but was refused consecration.

COX, HANNAH, 1796–1876; b. near Philadelphia; d. Philadelphia; one of the original abolitionists. She labored with Garrison, Lucretia Mott, and others, in protecting fugitive slaves. In these undertakings she had the aid of her husband; and their golden wedding was commemorated by poems from Whittier and Bayard Taylor.

COX, JACOB DOLSON, b. Canada, 1828. He studied law in New York, and afterward at Oberlin college, Ohio, in which state he was admitted to the bar in 1852. In 1859 he was elected to the legislature. In the war of the secession he was active on the union side, rising to be maj.-gen. of volunteers. In 1866 he was elected governor of Ohio; in 1869–70 he was secretary of the interior; in 1881 became dean of the law school of the University of Cincinnati; and in 1885, president of the university. He published, '82, *Atlanta* and *The Second Battle of Bull Run*.

COX, KENYON, painter, was b. in Warren, Ohio, in 1856; studied in Cincinnati and Philadelphia, and at the age of twenty-one went to Paris, where he remained seven years under the instruction principally of Carolus Duran and Gérôme. On his return to America, he became a member of the Society of American Artists, in New York. His work is chiefly in classic and allegoric presentations of the human figure. Both his portraits and landscapes are striking in their originality. Of his earlier efforts, the "Head of Venetian Girl" (1879); "Lady in Black" (1880); "Pink and White" (1881); "A Corner Window" (1884); and of his later, the "Vision of Moonrise," a landscape with a floating winged figure (1886); two life-size figures, entitled "Painting and Poetry" (1887); a portrait of the sculptor Augustus Saint-Gaudens (1887), which took the medal at the Paris Exposition, and "An Eclogue" (1890) are among his best.

COX, PALMER, artist and author, was b. in Quebec, 1840. In 1863 he became contributor to the *Golden Era* and other Western papers. In 1875 he went to New York, where he has since resided. He is best known through his Brownie drawings, which first appeared in 1880 in the *Wide Awake* magazine, and subsequently formed the basis of several books and of a popular play.

COX, RICHARD, 1499–1581; b. Buckinghamshire, England; educated at Eton and Cambridge. Wolsey invited Cox to Oxford, but he had adopted the reformed ideas, and the cardinal gave him imprisonment instead of preferment. He was afterward master of Eton school and prebendary of Ely cathedral. He was tutor to prince Edward, and when the latter became king, he made Cox one of the privy council and king's almoner. Mary put him in prison, but he escaped to Strasburg, where he lived with Peter Martyr. Elizabeth restored him to the see of Ely. Cox translated for the Bishops' Bible, the four Gospels, the Acts, and the Epistle to the Romans, and wrote a number of polemical essays.

COX, SAMUEL HANSON, D.D., LL.D., b. N. J., 1793, of a Quaker family. He

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began to study law, but left it for theology, and was ordained a Presbyterian minister in 1817. Three years later he had charge of a church in New York city, and was mobbed on account of his anti-slavery sentiments, his house and church being sacked. In 1834, he was chosen professor of sacred rhetoric in the theological seminary at Auburn, N. Y., and in 1837, became pastor of the First Presbyterian church in Brooklyn, remaining there until 1854. He was, in the mean time, professor of ecclesiastical history in Union theological seminary. At the division of the Presbyterian church, 1837, he became a leader in the new school branch, and was on several occasions a delegate to conventions in Europe, and at one time moderator of the general assembly. In 1854, his voice failed, and he resigned his pastorate. Among his published works are: *Quakerism not Christianity; Interviews, Memorable and Useful;* and many discourses. He d. 1880.

COX, SAMUEL SULLIVAN, 1824–89; b. Ohio; American author and politician. He was graduated at Brown univ., 1846; entered the law, but abandoned practice, and in 1853 became editor of the Columbus *Statesman*, obtaining the nickname of "Sunset Cox" from a flowery piece of descriptive writing which appeared in one of its numbers. He was for one year secretary of legation in Peru; from 1857–65 was a representative in congress from Ohio; in 1866 removed to New York; from 1869–72, and 1875–85 was a democratic representative from New York city; in 1885–86 was minister to Turkey; in 1886 was re-elected to congress. He was a popular lecturer. He wrote *The Buckeye Abroad* (1852); *Eight Years in Congress* (1865); *Search for Winter Sunbeams* (1870); *Why we Laugh* (1876); *Free Land and Free Trade* (1880); *Three Decades of Federal Legislation* (1886). *Diversions of a Diplomat in Turkey* (1887), etc. The letter-carriers of New York erected a statue of him in that city.

COXAL'GIA, or COXI'TIS, commonly called the "hip-joint disease." It is usually a severe inflammation in the joint, extending to the ligaments and surrounding soft substances. The form in which it oftenest appears in young persons is inflammation of the membraneous lining, and it frequently originates from rheumatism.

COXCIE, OR **COXIS,** MICHAEL, 1499–1592; a Flemish painter, known by his copy of the "Adoration of the Lamb," from the original, made by the brothers Van Eyck, for Philip II. of Spain, at a cost of two years' work. His illustrations of the story of "Cupid and Pysche" have furnished models for innumerable paintings and engravings.

COXE, ARTHUR CLEVELAND, D.D., b. 1818, in N. J.; a son of Samuel Hanson Coxe. He graduated at the university of New York in 1838, took orders in the Protestant Episcopal church, and officiated as pastor in New Jersey, Connecticut, Maryland, and New York. In 1865 he was chosen bishop of western New York, which office he held till his death in 1896. He was widely known as a writer, and among his works are some volumes of poems; *Sermons or Doctrinal Duty; Christian Ballads; Impressions of England;* and *Moral Reforms Suggested in a Pastoral Letter.*

COXE, WILLIAM, a very industrious historical writer, was b. in London, Mar., 1747, and was educated at Cambridge. As tutor to the sons of several noblemen, he, at various times, spent many years on the continent, where he neglected no opportunity of collecting information about the countries which he visited. The result appeared in many volumes of travels and history, all of which are characterized by close observation, care, and research; but the writing in general is far from sprightly. Among the best known of C.'s works is his *History of the House of Austria*, which is still a standard work. C. also wrote *History of the Kings of Spain of the House of Bourbon; Memoirs of the Duke of Marlborough; Memoirs of Sir Robert Walpole;* and *Memoirs of the Pelham Administration*, besides many contributions to our knowledge of the topography and social condition of several continental countries. He died June, 1828.

COXIM', one of the head-waters of La Plata, rises in Matto Grosso, a frontier province of Brazil, towards Bolivia and Peru. After flowing first to the n.e., and then to the n.w., it enters the Taquari, itself a tributary of the Paraguay, in lat. 18° 24' south.

COYOTE. See WOLF.

COY'PU, *Myopotamus coypu*, a rodent quadruped nearly allied to the beaver, with which it agrees in the number and character of its teeth, in its short limbs, in its feet having five toes each, the hinder feet webbed and the forefeet not webbed, and to a considerable extent in its habits; but from which it differs in the form of its skull, having a more elongated muzzle and a contracted palate, and in its slender tail resembling that of a mouse. It is the only known species of its genus, and inhabits great part of South America, on both sides of the Andes, burrowing in the banks of the rivers, and sometimes in forests near the sea-beach. It is very nearly equal in size to the beaver, has small ears, very long and stiff whiskers, and long hair mixed with dense and soft short hair, the upper parts beautifully penciled with different shades of yellow, the sides and under parts lighter and more uniform in color. The fur has become an important article of commerce, under the names of racoonda (q.v.) and nutria, the latter name signifying in Spanish an otter, having apparently been given to it by mistake, but being that chiefly used in Britain.

COZZENS, FREDERICK SWARTWOUT, 1818–69; b. N. Y.; in early life a wine-merchant, and editor of the *Wine Press*, for which he wrote papers on the culture of the grape and the manufacture of wine. This led him to more popular authorship, and he contributed to magazines. His first volume was *Prismatics, by Rishard Haywarde.* Then

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came the *Sparrowgrass Papers*, his best effort. Afterwards he published *Acadia, or a Sojourn among the Blue Noses;* and a *Memorial of Fitz-Greene Halleck.* One of his latest and best works is *Sayings, Wise and Otherwise.*

CRAB, the popular name of all the crustaceans of the order *decapoda* (the highest order of crustaceans, characterized by great concentration of the nervous system and corresponding general concentration, by five pair of thoracic limbs, and by having the gills inclosed in a special cavity on each side of the thorax, covered by the carapace) and sub-order *brachyoura* (characterized by the small size of the abdomen, which resembles a short tail curved under the thorax and appressed to it, all the most important viscera being included in the thorax), and extended also to some of the sub-order *anomoura* (purse-crabs, hermit-crabs, etc., characterized by a condition of abdomen intermediate between that of the *brachyoura* and that of the *macroura*, or long-tailed decapod crustaceans, such as the lobster, cray-fish, etc.). All the crabs, besides many other crustaceans, were comprehended in the Linnæan genus *cancer;* but the number of species is very great, and the *brachyoura* alone are now arranged into many genera and even families. The different kinds of crabs differ very much in the form of the carapace (the back), which in some is orbicular or nearly so; in some, much broader than it is long; in others, longer than broad; in some, prolonged in front into a kind of beak, etc.; also in its smoothness, or roughness with hairs, tubercles, or spines; in the length of the legs, etc. The eyes are compound, with hexagonal facets, and are elevated on stalks, which are generally short, but sometimes considerably lengthened, and which have the power of motion, so as to turn the eye in different directions. The first pair of limbs are not used for locomotion, but exhibit in great perfection the characteristic claws or pincers (*chelæ*) of the decapod crustaceans. Crabs are inhabitants of almost all seas; most of them, however, having their limbs formed for walking rather than for swimming, are found chiefly near the coast; some inhabiting comparatively deep water, and others abounding in those parts which are left by the receding tide, where they occur equally in the rock pools and among the moist sea-weeds. Some small kinds of crabs (*pea crabs*) are often found in the inside of mussels and other bivalve mollusks. Some crabs inhabit fresh water, particularly in the warmer parts of the world; and others, known as land-crabs (q.v.), live among moist herbage, or burrow in sand or earth. Some have the last pair of limbs expanded at the extremity into a broad blade for swimming, and some have even all the four pair of limbs intended for locomotion thus expanded, and sometimes occur far out at sea. Some of the crabs, with very long legs, are known as spider-crabs. Crabs molt or change their shell, not at fixed intervals or seasons, but according to the exigencies of their growth; the change being made with great frequency when they are very young, but rarely in advanced age; indeed, from the mollusks, and other animals sometimes found adhering to the carapace, it is inferred that the same covering is sometimes worn for a number of years.—The metamorphosis of crabs is noticed in the article CRUSTACEANS.—Crabs are interesting inmates of the aquarium, from their readiness in seizing food, their activity in tearing and eating it, their general habits, and, in particular, their pugnacity. The number of specimens is apt, however, to be soon diminished by the stronger killing and eating the weaker.—Many kinds of crabs are used as articles of food in different parts of the world, as the large edible C. (*cancer purus*) and small edible C. (*carcinus mœnas*) of the British shores. The latter is extremely common on all parts of the coast, but is not nearly so much esteemed as the former, which is much sought after, and is caught either in the holes of the rocks at low tide, or by means of a kind of trap, a basket which readily permits its entrance but not its escape, and which is baited with meat or animal garbage of some kind. In winter it seems to retire to deeper water. Its black claws and very broad carapace, arched at the sides, readily distinguish it from all other British species. It is sometimes nearly a foot in breadth. The claws of the edible C. were formerly ground to powder and used as a medicine, having, however, no properties but those of carbonate of lime. See illus., CRUSTACEANS, ETC.

CRAB, ROGER, a singular sectary of the English revolution, had served for seven years in the parliamentary army, and though he had his "skull cloven" by a royalist trooper, yet, for some breach of discipline, Cromwell sentenced him to death, a punishment subsequently commuted to two years' imprisonment. After his release from jail, C. set up in business as "a haberdasher of hats" at Chesham, in Buckinghamshire. His wandering mind, probably not improved by the skull-cleaving operation, then imbibed the idea that it was sinful to eat any kind of animal food, or to drink anything stronger than water. Determined to follow, literally, the injunctions given to the young man in the gospel, he sold off his stock in trade, distributing the proceeds among the poor, and took up his residence in a hut, situated on a rood of ground near Ichenham, where for some time he lived on the small sum of three farthings a week. His food consisted of bran, dock-leaves, mallows, and grass; and how it agreed with him we learn from a rare pamphlet, principally written by himself, entitled *The English Hermit, or the Wonder of the Age.* "Instead of strong drinks and wines," says the eccentric Roger, "I give the old man a cup of water; and instead of roast mutton and rabbit, and other dainty dishes, I give him broth thickened with bran, and pudding made with bran and turnip-leaves chopped together, at which the old man (meaning my body) being

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moved, would know what he had done, that I used him so hardly. Then I showed him his transgressions, and so the wars began. The law of the old man in my fleshly members rebelled against the law of my mind, and had a shrewd skirmish; but the mind, being well enlightened, held it so that the old man grew sick and weak with the flux, likely to fall to the dust. But the wonderful love of God, well pleased with the battle, raised him up again, and filled him full of love, peace, and content of mind, and he is now become more humble, for now he will eat dock-leaves, mallows, or grass."

The persecutions the poor man inflicted on himself, caused him to be persecuted by others. Though he states that he was neither a Quaker, a Shaker, nor a Ranter, he was cudgeled and put in the stocks; the wretched sackcloth frock he wore was torn from his back, and he was mercilessly whipped. He was four times arrested on suspicion of being a wizard, and he was sent from prison to prison; yet still he would persist in his course of life, not hesitating to term all those whose opinion differed from his by the most opprobrious names. He published another pamphlet, entitled *Dagon's Downfall, or the Great Idol digged up Root and Branch; the English Hermit's Spade at the Ground and Root of Idolatry.* This work shows that the man was simply insane. We last hear of him residing in Bethnal Green. He died on the 11th of Sept., 1680, and was buried in Stepney church-yard.—*Chambers's Book of Days,* vol ii. p. 334.

CRAB APPLE. See APPLE.

CRABB, GEORGE, 1778–1851: an English lawyer and philologist, a graduate of Oxford, author of text books on language and a *History of English Law,* but known chiefly by his valuable book on *English Synonyms.*

CRABBE, GEORGE, a popular English poet, was b. at Aldborough, in Suffolk, on the 24th Dec., 1754. His father was a warehouse keeper, and collector of the salt-duties at Aldborough, and exerted himself to secure for his son a superior education. C. early exhibited a passion for all kinds of book-learning, with a decided bias towards poetry. After being tolerably grounded at school in mathematics and classics, he was, in his 14th year, apprenticed to a surgeon at Wickham Brook, near Bury St. Edmunds; but he had no liking for the profession, and ultimately proceeded to London, where he arrived in 1780, with £3 in his pocket, to make a trial of literature. For a while he was very unfortunate. At last when threatened with arrest for debt, he resolved to make his case known to Burke. He told Mr. Lockhart, years after, "the night after I delivered the letter at the door, I was in such a state of agitation that I walked Westminster bridge backwards and forwards until daylight." The great orator at once appointed an interview, looked over C.'s poetical compositions, suggested several alterations which were adopted, and finally took *The Labarry* and *The Village* to Mr. Dodsley, by whom the first-named poem was published in 1781. C. went to reside at Beaconsfield with his generous and brilliant acquaintance, and while there met Fox, sir Joshua Reynolds, and lord Thurlow; the last of these invited the new celebrity to breakfast, and presented him with a bank-note for £100 at parting.

By the advice of Burke C. entered into holy orders, and was ordained curate of his native place in 1782. Shortly after, he was appointed domestic chaplain to the duke of Rutland, and took up his residence at Belvoir castle. *The Village* appeared in 1783, and established the reputation of its author. Shortly after lord Thurlow presented him with two small livings in Dorsetshire; and now, finding himself above all fear of want, he married Miss Sarah Elmy, and entered into the enjoyment of the purest domestic happiness. In 1785, he left the castle, and took up his residence in the parsonage of Strathern, thereafter for many years he botanized, studied geology, wrote poems, saw—in hurried visits to London—the distinguished men of his time, and was courted by them, enjoying an uninterrupted course of happiness and honor.

The Newspaper appeared in 1785; in 1807, C. published *The Parish Register;* in 1810, *The Borough;* two years after he produced his *Tales in Verse;* and in 1819, he gave to the world his *Tales of the Hall.* In 1813 his wife died, and shortly after he procured the living of Trowbridge, where for the remainder of his life he resided. In the autumn of 1822, he visited Edinburgh, and was the guest of sir Walter Scott. His health began to fail in 1828; he died on the 3d of Feb., 1832, aged 78.

C. disdained all the luxuries of his art. He has no heroes with a Hyperion front, and no heroines radiant as Aurora. He worked with the delf, not with the porcelain of human clay. He concerns himself with wild smugglers, denizens of villages by the sea, full of ancient and fish-like smells; gypsies on the heath cooking the fowl purloined from the neighboring barnyard; with tramps, vagabonds, and vagrants, and the inmates of the workhouse. On his page these unsavory individuals live, carouse, curse, brawl, and die. He has pages stern as anything in *The Inferno;* many droll as Hogarth's pictures; and one or two so sweet, and tender, and pathetic, that no man possessed of any sensibility can read them unmoved.

CRABETH, DIRK and WOUTER, the last surnamed the Elder, were two brothers, glass-painters, b. (it is supposed) at Gouda in s. Holland, and who flourished in the latter half of the 16th century. It seems Dirk visited France in his youth, whilst Wouter journeyed to Italy, where he studied the works of Raphael, as is evident from his productions. Wouter, it is said, surpassed his brother in drawing, grace, and clearness,

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whilst Dirk surpassed him again in coloring. They, however, were jealous of each other, and each concealed from the other the secrets of his processes. Their conjoint work in the church of St. John at Gouda, is the masterpiece of the two brothers. Of the eleven painted windows in that church, seven are by Dirk, and four by Wouter. They were done between 1555 and 1571. Dirk died it is believed in 1601. It is unknown when Wouter died. The brothers were buried in the sanctuary of St. John.

CRA'BRO, a genus of hymenopterous insects of the family crabronidæ, section *aculeata*, and sub-section *fossores*, or "burrowers," creatures of the hornet family, which excavate nests in decayed wood, fences, etc.

CRACKED HEELS. From careless grooming, washing horses' legs and imperfectly drying them, permitting them to stand in accumulations of filth or exposed to draughts, the skin becomes inflamed, tender, itchy, thickened, and by and by cracked. An ichorous noisome discharge exudes, and lameness often results. In animals with round, *gummy* legs, it is sometimes constitutional; underbred horses with rough hairy fetlocks present the majority of cases; white heels, being more delicate, are especially affected; whilst the hind limbs, exposed as they are to filth and cold, suffer most frequently. Cleanse carefully with tepid water; wash with a diluted solution of Goulard's extract, or any other mild astringent· or dress occasionally with oxide of zinc ointment.

CRACKER STATE. See STATES, POPULAR NAMES OF.

CRACKER. See BISCUIT.

CRACKERS, the name given in the Southern U. S. to the poor and ignorant whites, probably because of their usual diet, which is cracked corn ground into a coarse meal. The term "corn-crackers," is employed in the same sense.

CRACK'LIN, a kind of chinaware, the glazing of which is purposely cracked in the kiln, as an ornament.

CRACOVIENNE, (*krakowiak*), the national dance of the Polish peasantry around Cracow. It has a rather melancholy than lively melody in ⅔ time, and is accompanied by singing. The pair who lead off the dance often begin with only the music of their own voices, and are soon followed by others, and the charm of the dance consists much in the diverting movements by which they seem to chase and avoid each other. The Poles have a multitude of little ditties of two lines each, adapted to this music and dance, which generally contain some allusion to natural phenomena.

CRA'COW (Pol. *Krakov*), formerly the capital of a small Polish republic, and anciently the capital of the kingdom of Poland, is now an Austrian city, situated on the left bank of the Vistula, where it becomes a navigable river, in a beautiful plain surrounded by an amphitheater of gentle hills. Lat. 50° 4′ n., long. 19° 52′ east. Pop. '90, 76,025. It contains many churches, monasteries, nunneries, and Jewish synagogues. The ancient city of C. is a labyrinth of narrow, dark, and deserted streets, but contains many fine specimens of Gothic architecture in its churches and other edifices; and some handsome buildings are also to be seen in the more modern suburbs. The old walls have been converted into a promenade. In the midst of the houses rises the castle, a huge building of an imposing appearance. The cathedral contains the tombs of many of the Polish kings, and of some of the greatest men of the Polish nation. The university was founded in 1364, by Casimir the Great, whose design was carried into effect by Jagello and Hedwig in 1401. It was long the center of light for Poland, but decayed under the influences of the Jesuits, till it ceased to exist. It was reorganized and reopened in 1817, and underwent important changes in 1833. It possesses a museum of natural history, a botanic garden, an extensive library, and many MSS. of great value in connection with Polish history. Cracow's manufactures are trifling, and its trade, at one time extensive, became for a period, very limited, but has of late years greatly revived, owing to the extension of its railway communications, which connect it with Vienna, Berlin, Warsaw, and Lemberg. Three miles w. of the city is a vast tumulus to the memory of Kosciusko. It is composed of earth taken from all the patriotic battle-fields of Poland.

According to a legend, the name is derived from Krak, who founded the city about 700 A.D. It became the capital of Poland in 1320, and continued to be so till 1609, when that honor was transferred to Warsaw by Sigismund III. It was taken by the Bohemians in 1039, by the Mongols in 1241, by the Swedes in 1655 and 1702, and by the Russians in 1768. On the third partition of Poland, in 1795, it was assigned to Austria. From 1809 to 1815, it formed part of the duchy of Warsaw. The congress of Vienna established it as a republic, with a small territory containing about 140,000 inhabitants, under the protectorate of Russia, Prussia, and Austria. The territory bordered with that of each of these great powers. Internal dissensions between the nobles and the common people afforded a pretense for interference, and the sympathy shown by the inhabitants of C. for the cause of Polish independence in 1830 and following years was made the ground of proceedings, which terminated in 1846 in the annexation of C. to the Austrian dominions, a measure alleged to be necessary for the security of the neighboring states, but against which Britain and France protested. C. now forms part of the Austrian crown-land of Galicia. An extensive line of fortifications has been constructed around it by the Austrians, with numerous detached forts, and one

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immense fortress on a height commanding the city, whose outworks extend over a space of about five miles.

CRADDOCK, CHARLES EGBERT. See MURFREE, MARY N.

CRAFT is a general designation for lighters, hoys, barges, etc., employed in loading or unloading large ships. In the U. S. navy, the name *small C.* is sometimes given to vessels commanded by lieutenants, such as cutters, schooners, gun-boats, etc. Also a term applied by seamen to any vessel whatever.

CRAFTS, WILBUR FISK, b. Fryeburg, Me., 1850; was educated at Wesleyan univ. and Boston univ. school of theology, where he graduated at the age of 21 years. After holding various pastorates in the Meth. Epis. church, he became a Cong. minister, 1880; but from 1883–88 was the pastor of the First Union Pres. church of New York. Dr. C. has manifested great interest in Sunday school work, was conductor of an international Sunday school parliament at the Thousand Islands 1876–7, and is the author of a number of books designed primarily for the Sunday schools (in some of which he has been assisted by his wife), and of *Must the Old Testament Go*, 1883; *Successful Men of To-day*, 1883; and of *The Sabbath for Man*, 1885, probably the most complete and judicious presentation of the claims of the Lord's Day. He resigned his pastorate, 1888, to become sec. of the American Sabbath union.

CRAIG, a co. in s.w. Virginia, on the West Virginia border, e. of the Alleghanies; 381 sq.m.: pop. '90, 3835, inclu. colored. The surface is rough, but the valleys are fertile. Agriculture is the main business. Co. seat, New Castle.

CRAIG, JOHN, an eminent preacher of the reformation, was b. in Scotland about 1512. Having spent some time as a tutor in England, he returned to Scotland and entered the Dominican order, of which he had not long been a member when he fell under the suspicion of heresy, and was cast into prison. On his release, he traveled on the continent; and after some time was, through cardinal Pole's influence, intrusted with the education of the novices in connection with the Dominican order at Bologna. While here, Calvin's *Institutes* fell in his way, and converted him to Protestant doctrines. Having openly avowed the change in his opinions, he was brought before the inquisition, and sentenced to be burnt—a fate from which he was saved by the mob, on the death of pope Paul IV., breaking open the prisons in Rome, and setting the prisoners at liberty. C. escaped to Vienna, and obtained some favor at the court of Maximilian II.; but the news of his being there reached Rome, and the pope demanded his surrender as one condemned for heresy. The emperor, however, instead of complying with the request of his holiness, gave C. a safe-conduct out of Germany. He now returned to Scotland, and was appointed the colleague of John Knox in the parish church of Edinburgh. Thinking the marriage of queen Mary and Bothwell contrary to the word of God, he, while holding this position, boldly refused to proclaim the banns. In 1572, C. was sent "to illuminate the dark places" in Forfarshire and Aberdeenshire, and remained in the north until 1579, when he was appointed minister to king James VI. in Edinburgh. He now took a leading part in the affairs of the church, was the compiler of part of the *Second Book of Discipline*, and the writer of the national covenant signed in 1580 by the king and his household. He was a man of great conscientiousness, and was not slow to oppose the proceedings of the court when he deemed them opposed to Scripture, and to speak wholesome but unpleasant truths to his majesty himself. He died Dec., 1600.

CRAIG, THOMAS, author of the well-known *Treatise on the Feudal Law*, was b. probably about 1538. What part of Scotland he was born in is not known. Educated first at St. Andrews, he afterwards prosecuted his studies at Paris, and passed as an advocate at the Scottish bar in Feb., 1563, and in that or the following year was appointed justice-depute to Archibald earl of Argyle, hereditary justice-general of Scotland. In literary pursuits, C. had distinguished himself above all his contemporaries, and while at the head of the criminal judicature of Scotland he did not neglect the *belles-lettres*, as is evidenced by an epithalamium on the queen's marriage with Darnley, and by a poem on the birth of James I. Besides his work on *Feudal Law*, C. wrote on the *Succession to the Throne of England*, in which he took a warm interest; a treatise on the union of Scotland and England, and one on *Homage*, vindicating Scotland from the charge of feudal dependence on England, which had been asserted by Hollinshed in his *Chronicles*, together with many poetical pieces. In the latter part of his life, C. acted as advocate for the church of Scotland. He seems to have been high in favor with James VI., who wished to confer the honor of knighthood upon him; and when C. steadily refused, ordered that all persons should address him as if he really had accepted the honor. He died Feb., 1608.

CRAIGHEAD, a co. in n.e. Arkansas, bounded on the e. by the St. Francis river and lake; 668 sq.m.; pop. '90, 12,025, inclu. colored. Chief productions, corn, cotton, and tobacco. Co. seats, Lake City and Jonesboro.

CRAIGLEITH' STONE, a silicious sandstone belonging to the carboniferous series, quarried at Craigleith, near Edinburgh, and largely used for building in that city, for which it is admirably adapted by its purity, durability, and the ease with which it can be wrought.

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CRAIG AND TAIL, a term used to designate a peculiar hill conformation, in which a bold and precipitous front exists on one aspect of a hill, while the opposite is formed of a sloping declivity. Those who first observed this form of the surface, believed it was the effect of currents of water moving in the direction indicated by the C. and T.; but latterly there have been speculations calling in the aid of ice, though not excluding the presence of water also. Fine examples of this structure occur in and around Edinburgh, where the western current has left the bold "craig" facing the w., and the "tail" sloping towards the e.; as, for example, the castle rock, precipitous and unapproachable on every side except to the e., where it has protected the shale and sandstone beds from erosion.

CRAIGENPUTTOCK, a farm in the s.w. part of Dumfriesshire, Scotland, 12 miles n. of Castle Douglas, celebrated as the residence of Thomas Carlyle. It belonged to Jane Welsh before her marriage to the author, and they took up their abode there in 1828. Much of Carlyle's writing was done at C., and there are frequent references to it in his published correspondence.

CRAIGIE, PEARL RICHARDS (pen name, JOHN OLIVER HOBBES), novelist; b. in Boston, in 1867. Her father removed to England while she was still a child. She married an officer in the Bank of England, but the marriage proved an unhappy one, and she was divorced in 1895. Her first book appeared in 1891, and she has since then written a number of books, including *Some Emotions and a Moral*, *the Sinner's Comedy*, *a Study in Temptations*, *The Gods, some Mortals, and Lord Wickenham*, *A Bundle of Life* (1894), etc., and a play, *Journeys End in Lovers' Meeting*.

CRAIK, DINAH MARIA **MULOCK**, b. 1826; an English authoress, chiefly of works of fiction: the daughter of a clergyman. In 1849 she published *The Ogilvies*, her first novel, and rapidly afterwards, *Olive*; *The Head of the Family*; *Alice Learmont*; *Agatha's Husband*; *John Halifax, Gentleman* (a wonderful success); *A Life for a Life*; *Christian's Mistake*; *Two Marriages*; *A Noble Life*; *The Unkind Word*; *Fair France*; and a great number of short papers. In 1865 she married George Lillie Craik. Among her latest works are *Sermons out of Church*, *Life and Remains of John Martin*, *Schoolmaster and Poet*, and *Thirty Years' Poems*. She d. 1887.

CRAIK, GEORGE LILLIE, was by birth a Scotchman. Born in Fifeshire in 1799, he was educated for the church at St. Andrews university, but, preferring a literary career, he went to London in 1824. His first work of importance was the *Pursuit of Knowledge under Difficulties* (1831), forming part of the series of publications issued by the society for the diffusion of useful knowledge. He also contributed largely to the *Penny Cyclopædia*. In 1839, C. became editor of the *Pictorial History of England*, some of the most valuable chapters of which were written by himself, and have since been enlarged and republished separately as independent works. Such are his *Sketches of the History of Literature and Learning in England from the Norman Conquest to the Present Time* (6 vols., 1844), and his *History of British Commerce from the Earliest Times* (3 vols., 1844); and in the same year, *Bacon, his Writings and Philosophy*. In 1849, C. was appointed to the chair of history and English literature in Queen's college, Belfast, a situation which he occupied till he died in 1866. C. possessed an energetic mind, his thinking was clear, his style accurate, and he was conscientious in his statement of facts. Many of his slighter works contained suggestions in politics and social science which were both valuable and original, some of which were afterwards appropriated by, or ascribed to, others. In the first class we may mention the idea of mutual citizenship; and in the second, that of the representation of minorities, which unquestionably originated with him. Between 1849 and 1852, appeared his *Romance of the Peerage*; in 1855, his *Outlines of the History of the English Language*, which has passed through various editions; and in 1857, his essays on *The English of Shakespeare*, successive editions of which appeared in 1859, 1866, and 1867.

CRAIK, JAMES, 1731–1814; a native of Scotland, family physician to George Washington. He accompanied Washington in the Braddock expedition, and subsequently entered the medical service of the revolutionary army, being director of the hospital at Yorktown. After the war he settled near Mt. Vernon, and attended Washington until his (Washington's) death.

CRAIL, a royal and parliamentary borough and seaport in the "East Neuk" of Fifeshire, 2 m. s.w. of Fifeness, and 10 m. s.e. of St. Andrews. Pop. '91, about 1500. C. was a town of some note in the middle ages, being then called Caryll. In 847, there was a skirmish with the Danes here, and at Fifeness there are still the traces of what is believed to have been a Danish encampment. There are traces of an old castle, in which David I. occasionally resided; of a priory college, and other adjuncts of an ecclesiastical establishment. It was after a sermon preached in the established church in C. by Knox in 1559, that his hearers rushed in an infuriated mob to St. Andrews, and burnt the magnificent cathedral of the Episcopal metropolis. Archbishop Sharp was for some time minister of Crail.

CRAKE, *Crex*, a genus of birds of the rail family (*rallidæ*), differing from the true rails in having the bill shorter than the head and comparatively thick. The wings are also armed with a small concealed spine. The name is derived from the harsh call-note of the male. The best known species is the common corn-crake or land-rail (*C. pratensis*), the frequent call-note of which is heard from every field of corn or rye-grass in valleys and low grounds in the early part of summer, and is associated by almost every

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inhabitant of Britain with all that is pleasant in that pleasant season. The corn-crake is a very pretty bird, of a reddish-brown color, marked with dark-brown in streaks along the middle of the feathers, lighter below; it has rather long legs and long toes; the tail is very short and pointed. It runs very swiftly, so as to be able sometimes to escape from a dog; but flies rather heavily, although it is a bird of passage, and is seen in Britain only in summer. It visits, in like manner, all the northern parts of Europe, and extends its migrations even to Iceland, spending the winter on the shores of the Mediterranean and in Africa. Its call-note may be so exactly imitated by passing the edge of the thumb-nail briskly along the points of the teeth of a small comb, that it can thus be decoyed within a short distance, although it is a very shy bird, and multitudes are familiar with its cry who never saw it in their lives. Its weight is ordinarily about six ounces. It is very highly esteemed for the table; and, according to Drayton, "seldom comes but upon rich men's spits." Two or three other species, very rare in Britain, but more common in the southern parts of Europe, are chiefly found in marshy grounds, and sometimes receive the name sora (*zapornia*). With them is ranked the Carolina rail or sora rail (*C. Carolinus*) of North America, which spends its winters in the states near the gulf of Mexico, but migrates northwards in summer, and is sometimes seen in vast numbers about marshes and the reedy margins of lakes and rivers, particularly in its migration southward in autumn. Its size is about equal to that of the corn-crake; and its color is very similar, but with mingled short streaks of white. It is much esteemed for the table.

CRAMBÉ, a genus of plants of the natural order *cruciferæ;* having a pouch (*silicle*) of two unequal joints, of which the upper is globose and one-seeded, the lower abortive. The cotyledons are conduplicate. The species, which are not very numerous, are scattered over the world. One is a native of Britain, *C. maritima*, the well-known sea-kale (q.v.). Another, *C. Tartarica*, with much divided leaves and a great fleshy root, a native of Hungary and other central parts of Europe and of Asia, is sometimes called Tartar bread; and its root is eaten in the countries of which it is a native.

CRAMER, JOHN BAPTIST, 1771–1858; a German composer of music, who passed the most of his life in London. His work is esteemed for simplicity of construction, grace, and beauty.

CRAMER, MICHAEL JOHN, Meth. Epis. clergyman and author, b. in Switzerland 1835, graduated at the Ohio Wesleyan University 1860, was a chaplain in the U. S. army 1864–67, and later U. S. minister to Denmark and minister to Switzerland. From 1885–87 he was Professor of Systematic Theology in the Boston University. He wrote largely for theological periodicals, and became associate editor of the *Theological Quarterly Review* in 1889. D. 1898.

CRAMP, an irregular, involuntary, and painful contraction of a voluntary muscle, without insensibility or other disturbance of the general system. C. is often the effect of cold, and has proved fatal to swimmers by attacking them suddenly when in the water. Otherwise it is a disease of little importance, and readily removed by warmth and friction, with regulated movement of the muscles affected. Cramps are a distressing symptom in cholera (q.v.), in which disease it has been proposed to treat them by applying a tight bandage or tourniquet (q.v.) to the affected limbs. See SPASM.

CRAMPEL, PAUL, African traveler, b. in France, 1863. After a successful journey in 1888–89 through the Fan country, he was sent as an agent of the French Company of Africa to Lake Chad. With a small force of Sengalese soldiers and a few Europeans, he marched from Stanley Pool to Bangi on the Mobangi river, and thence north to El Kuti, where he was deserted by his carriers. While trying to force his way further north he was murdered by the Moslems, and only one of his European companions escaped.

CRAMP FISH. See TORPEDO.

CRAMP RINGS, were rings which were supposed to cure cramp and the "falling-sickness." They are said to have originated as far back as the middle of the 11th c., in a ring presented by a pilgrim to Edward the Confessor, which, after that ruler's death, was preserved as a relic in Westminster abbey, and was applied for the cure of epilepsy and cramp. Hence appears to have arisen the belief that rings blessed by English sovereigns were efficacious in such cases; and the custom of blessing for distribution large numbers of C. R. on Good Friday continued to exist down to the time of queen Mary. The accomplished lord Berners, ambassador to Spain in Henry VIII.'s time, writes from Saragossa to cardinal Wolsey: "If your grace remember me with some crampe rynge ye shall doo a thing muche looked for; and I trust to bestow thaym well with Goddes grace." The metal the rings were composed of was what formed the king's offering to the cross on Good Friday, usually either gold or silver. The superstitious belief in the curative property of C. R. made out of certain pieces of silver obtained in particular ways, still lingers in some of the less enlightened English counties.

CRANACH, LUCAS, a celebrated German painter, was b. in the bishopric of Bamberg in the year 1472. Little is known of his early life, except that he was instructed in art by his father—that he visited Palestine in 1493, with the elector Frederick the Wise of Saxony, who made him his court painter in 1504, at which period we find him in high reputation, especially noted for his facility. In 1508, the elector made him a grant of armorial bearings, having for crest a winged serpent. He made a journey into the Netherlands in 1509, and there drew a picture of Charles V.—the future emperor—then

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nine years old. C. seems to have acted as *factotum* at the court of the elector and his two successors, preparing for and directing the ceremonies and festivities, and knew besides how to follow other lucrative trades. In 1520, he bought an apothecary's business at Wittenberg, where he was also a bookseller and paper-maker, became councilor and chamberlain, and was twice chosen burgomaster of the town.

C. was closely bound up with the early reformers. He was the intimate friend of Luther, whose picture he several times painted. In 1550, he went to Augsburg to share the imprisonment of the elector, and returned with him to Saxony in 1552. C. died at Weimar, on the 16th Oct., 1553, in the 81st year of his age, and was buried in the court church there. He had two sons, one of whom, Lucas, was known by the name of "the younger Cranach," an excellent colorist and portrait-painter.

C. has left behind him an unusually large number of authentic pictures—indeed, he painted beyond his powers. He excelled in portraits, in painting animals, in fabulous and droll pieces, and was an excellent colorist; but failed in form, grace, and unity, and in the higher walks of art. His last and greatest work is an altar-piece in the church of Weimar—a mystical representation of the crucifixion. His peculiar humor is best seen in such pictures as his "Samson and Delilah" and his sylvan scene containing "Apollo and Diana." See illus., CORREGGIO, ETC.

CRANBERRY, *Oxycoccus*, a genus of small evergreen shrubs of the natural order *vaccineæ*, distinguished from the genus vaccinium (see HUCKLEBERRY) by the wheel-shaped corolla, with segments rolled back and the filaments leaning to the pistil. The species are few, natives of the colder regions of the northern hemisphere. The fruit is acid, and is in great request for making tarts. The only British species is the common C. (*O. palustris*, formerly *vaccinium oxycoccus*), a native also of the northern parts of Europe, Asia, and America. It grows in peaty bogs and marshy grounds, and is a small wiry shrub with creeping thread-like branches, and small oval leaves rolled back at the edges. The blossoms are small but beautiful, of a deep flesh color. Large quantities of the fruit are collected in some places in the n. of England, and in other countries, although the draining of bogs has now made it scarce where it was once plentiful. In Germany it is collected by means of a wooden comb, and preserved with sugar. In England, cranberries are often preserved in bottles closely corked or filled with pure water, in which they may be kept for a long time. They are an excellent addition to sea stores. Wine is made from them in Siberia, and a beverage made from them is sold in the streets of St. Petersburg.—The AMERICAN C. (*O. macrocarpa*) is a much larger and more upright plant, with leaves much larger and less rolled back at the margin. The berries are also larger and of a brighter red. It is a native of North America, frequent in Canada, and as far south as Virginia, growing in bogs, and particularly in elevated situations and where the soil is sandy. The berries are collected by means of a rake. Large quantities of them are exported to Europe. Cranberries are imported into Britain from Russia and other parts of the continent. Both kinds may be cultivated in gardens, in a peat-soil kept very moist, or round the margin of a pond; and the produce of a small space properly managed is so great, that it is surprising that a C. plot should not be much more frequent.—The berries of the red whortleberry (*vaccinium vitis idaea*) are sold under the name of cranberries in Aberdeen and other places, and are used in the same way.—A third species of C. (*O. erecta*, formerly *vaccinium erythrocarpon*), a native of lofty mountains in Virginia and Carolina, is a shrub 2 ft. high, and with a habit more like that of the whortleberries than of the other cranberries; it has a fruit remarkable for transparency and of exquisite flavor, and appears to deserve an attention and cultivation which it has not yet received.—The TASMANIAN C. is the fruit of *astroloma humifusum*, a little shrub with trailing stems, leaves somewhat resembling those of juniper, and beautiful scarlet blossoms, which is found in all parts of Van Dieman's Land. It belongs to the natural order *epacridaceæ*. The fruit is of a green or whitish color, sometimes slightly red, about the size of a black currant, and consists of a viscid apple-flavored pulp, inclosing a large seed.—*Styphelia adscendens*, a small prostrate Australian shrub of the same natural order, has a fruit very similar to this; and in New South Wales the name C. is likewise given to the red acid berries of *lissanthe sapida*, a low evergreen shrub, with small white flowers, also belonging to *epacridaceæ*.

CRANCH, CHRISTOPHER PEARSE, painter and author, b. Va., 1813: graduated from Columbian college, Washington; in 1831, studied in the divinity school of Harvard university, and was licensed to preach; but he turned his attention to landscape painting. Besides producing a great number of landscape paintings, he has written much for current magazines, and has published tales for children, and a volume of poems. He d. in 1892.

CRANCH, WILLIAM, LL.D., 1769–1855; b. Mass.; graduate of Harvard, and bred to the bar, being admitted in 1790. In 1801 he was appointed a justice of the United States circuit court for the district of Columbia, and in 1805 he was promoted to chief-justice, which position he held all his life. His reports of the decisions of his own court and of the United States supreme court are widely known.

CRANDALL (PHILLEO), PRUDENCE, a member of the society of Friends, born at Hopkinton, R. I., in 1803, who in 1832 opened a private school at Canterbury, Conn., to which she admitted some colored girls. For this she was insulted, boycotted, and imprisoned, her house was burned, and finally she was driven from the town. She

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married Rev. Calvin Philleo, a Baptist minister, removed to New York state, and finally to the West. Fifty years later the people of Canterbury petitioned the state legislature to make good her losses. She d. in 1890.

CRANE, STEPHEN, American author, b. 1871, began to write for the press at the age of 16, and published, while still a very young man, a story called *The Red Badge of Courage.* This was followed by *Maggie, a Girl of the Streets,* a story which deals very frankly with life among the lower classes in New York City, and *The Third Violet* (1897), a story of artist life.

CRANE, THOMAS FREDERICK, linguist, was born in New York city, July 12, 1844. He graduated at Princeton college in 1864, and was appointed professor of modern languages in Cornell in 1868, and of the Romance languages there in 1881. He has contributed a large number of articles to the leading periodicals of the day on folklore. He was one of the founders of the American folklore society (1888). Among his books are *Italian Popular Tales* (1885), *Le Romantisme Français* (1890), *Chansons Populaires de la France* (1891), etc.

CRANE, WILLIAM HENRY, actor, was born in Leicester, Mass., in 1845, and was educated in the Boston schools. In 1863 he made his first appearance on the stage in the Holman opera company, taking the part of the notary in Donizetti's *Daughter of the Regiment.* In 1865 he turned his attention to comedy, and in 1870 became a member of the Alice Oates company, with which he remained for four years. In 1874 he played at Hooley's theatre in Chicago, where he filled the leading comedy *rôles,* and later acted in San Francisco for nearly a year. Returning East, he made his first marked success with Stuart Robson at the Park theatre, N. Y. city, in Grover's farcical play, *Our Boarding House.* Since then he has added to his reputation by his excellent work in the *Comedy of Errors, The Henrietta, The Senator* (1890), and *The American Minister* (1892).

CRANE, *Grus,* a genus of birds of the order *grallatores,* the type of the family *gruidæ.* This family differs from herons, bitterns, storks, etc., in having the hind-toe placed higher on the leg than the front ones. It consists also of birds less addicted to marshy places, and which feed not only on animal, but, to a considerable extent, on vegetable food. They are all large birds, long legged, long necked and of powerful wing, although their wings are rounded and not elongated; some of them performing great migrations, and flying at a prodigious height in the air. One of these is the COMMON C. (*G. cinerea*), which breeds in the northern parts of Europe and Asia, retiring in winter to tropical or sub-tropical regions. Flocks of cranes periodically pass over the southern and central countries of Europe, uttering their loud harsh cries in the air, and occasionally alighting to seek food in fields or marshes. The C., when standing, is about 4 ft. in height; the prevailing color is ash-gray, the face and throat nearly black, the wing primaries black. The tertial feathers of the wings are elongated, reaching beyond the ends of the primaries, and their webs are unconnected; they are varied and tipped with bluish-black, and are the well-known plumes once much used in ornamental head-dresses. The visits of the C. to Britain are now very rare, although in former times they were comparatively frequent. It feeds on roots, seeds, etc., as well as on worms, insects, reptiles, and even some of the smallest quadrupeds. It is much esteemed for the table.—There are several other species of crane. The WHOOPING C. (*G. Americana*) is considerably larger than the common C., which it otherwise much resembles except in color; its plumage, in its adult state, is pure white, the tips of the wings black. It spends the winter in the southern parts of North America. In summer it migrates far northwards, but rather in the interior than the eastern parts of the continent.—To the C. family belong also the demoiselles (q.v.), with which, rather than with the true cranes, the Balearic cranes or Balearicans are ranked.—Cranes use their bill as a dagger, and when wounded are dangerous to the eyes of a rash assailant. See illus., DEER, ETC., vol. IV.

CRANE, a machine employed for the purpose of lifting weights. Cranes are of various kinds, but the most common consist of an upright revolving shaft, with a projecting arm or jib, having a fixed pulley at the extremity, over which is passed one end of the rope or chain to receive the weight, the other end being attached to a cylinder with wheel and pinion, by means of which the weight is raised to the required height. By the revolving motion of the upright portion, the load can be deposited on any spot within the sweep of the jib. See illus., PULLEY, ETC., vol. XII.; DIVING APPARATUS, vol. V.

CRANE-FLY, *Tipula,* a genus of dipterous (two-winged) insects of the family *tipulidæ,* to the whole of which the name C. is often extended, nearly allied to the gnat family.

CRANGON. See SHRIMP.

CRA'NIUM. See SKULL.

CRANK, in machinery, is an arm or a bend on an axle or shaft, which may be driven by a connecting-rod or by the hand, its use being to convert an alternating straight motion into a continuous revolution. A crank may have part of the shaft on both sides, so that one rod may drive two wheels. There are two positions in a C. in which the connecting-rod exercises no power whatever—viz., when the arm of the crank is parallel to the connecting-rod, and again when the crank is at the opposite point of its course. A push or pull of the rod in such circumstances can only press the shaft against its

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bearings. The effect is greatest when the rod and the crank-arm are at right angles, and it decreases gradually on both sides of that position, until at the top and bottom it is reduced to nothing. In order to carry the C. over these *dead points*, as they are called a fly-wheel is fixed on the shaft; this receives part of the force of the rod while at its best, acts as a reservoir, and by its stored-up momentum carries the shaft round when the rod is powerless.

CRANMER, THOMAS, one of the chief reformers of the English church, and the first Protestant archbishop of Canterbury, was b. at Aslacton, in the co. of Nottingham, on the 2d of July, 1489. He was descended from an old Norman family, which is said to have come into England with William the Conqueror. In his 14th year, he went to Jesus college, Cambridge, of which he was elected a fellow in 1510. He devoted himself diligently to the study of the learned languages, and also to the study of Scripture. His mind seems to have been early interested in the writings of Erasmus, Luther, and Le Fevre, and especially in their interpretations of Scripture. In his 23d year, he married, and so lost his fellowship; but his wife dying about a year after marriage, he was restored to it by his college. In 1523, he took his degree of D.D., and was appointed lecturer on theology. In 1528, during the prevalence of the sweating sickness in Cambridge, he retired with two pupils to Waltham abbey: and Henry VIII., in company with Gardiner and Fox, afterwards bishops of Winchester and Hereford, happening to be in the neighborhood, the event proved a turning-point in the life of Cranmer. The king was then seriously concerned about his divorce from Catharine of Aragon, and in conversation on the subject with Gardiner and Fox, C. suggested that the question should be "tried according to the word of God." Fox having mentioned this suggestion to the king, Henry was greatly pleased, and "swore by the mother of God, that man hath the right sow by the ear." From this time, Henry never lost sight of Cranmer. He was asked to reduce his suggestion to writing, and to have it submitted to the European universities. After this he was appointed archdeacon of Taunton, and one of the royal chaplains. He was also sent to Rome on a special embassy about the divorce, but met with little success. Subsequently, he was dispatched to the emperor on the same errand, and while in Germany, he married a second time, a niece of the German divine, Osiander. This took place in 1532; and shortly afterwards, on the death of archbishop Warham, he was recalled to fill the vacant see. Under his auspices, Henry's divorce was speedily carried through, and C. married the king to Anne Boleyn, on the 28th May, 1533. In Anne's subsequent disgrace, and again, in the affair of Anne of Cleves, the archbishop took a part not very creditable to him. His position was no doubt a difficult one; but his character was naturally pliable and timid, rather than resolved and consistent. The same spirit characterizes the measures of religious reform which were promoted by him. On the one hand, he joined actively with Henry in restricting the power of the pope, and in suppressing the monasteries; but, on the other hand, he was no less active in persecuting men like Frith, Forrest, and others, who, on matters of religious faith, were disposed to advance further than himself or the king. He did what he could, however, to resist the reactionary movement which took place in 1539, and which is known by the institution of the "six articles." He was also instrumental in promoting the translation and circulation of the Scriptures. On Henry VIII.'s death, C. was appointed one of the regents of the kingdom, and along with Latimer and others, largely contributed to the advance of the Protestant cause during the reign of Edward. He assisted in the compilation of the service-book and the articles of religion. The latter are said to have been chiefly composed by him. He was also the author of four of the homilies.

On the accession of Mary, he was committed to the Tower, along with Latimer and Ridley. In Mar., 1554, they were removed to Oxford, and confined there in the common prison, called the Bocardo. Latimer and Ridley bore their cruel fate with magnanimous courage; but the spirit and principles of C. temporarily gave way under the severity of his sufferings. He was induced, in the hope of saving his life, to sign no fewer than six recantations; but his enemies were determined to be satisfied by nothing short of his death. On the 21st Mar., 1556, he suffered martyrdom, as his fellow-reformers had done, opposite Balliol college. His courage returned at the end, and he died protesting his repentance for his unworthy weakness in changing his faith, and showing an unexpected fortitude in the midst of the flames.

CRANNOGES, the name given in Ireland and in Scotland to the fortified islands in lakes which were in common use as dwelling-places and places of refuge among the Celtic inhabitants. The etymology of the word is uncertain, but it is believed to refer to the timber which was employed either in the fortification of the island, or in the construction of the houses which were placed upon it.

The earliest notice of such lake-dwellings which has been observed, is in the pages of Herodotus (book v. chap. 16). Writing of the Persian invasion of Thrace and Macedonia under Darius—about 500 years before the Christian era, and less than 100 years before his own death—he relates how the satrap Megabazus, warring against the Pæonians, led certain tribes of them captive into Asia, but failed to conquer those who inhabited lake Prasias. "He sought, indeed," says the historian, "to subdue the dwellers upon the lake, but could not effect his purpose. Their manner of living is the

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following. Platforms, supported upon tall piles, stand in the middle of the lake, which are approached from the land by a single narrow bridge. At the first, the piles which bear up the platforms were fixed in their places by the whole body of the citizens; but since that time the custom which has prevailed about fixing them is this· They are brought from a hill called Orbelus, and every man drives in three for each wife that he marries. Now, the men have all many wives apiece, and this is the way in which they live. Each has his own hut, wherein he dwells, upon one of the platforms, and each has also a trapdoor giving access to the lake beneath; and their wont is to tie their baby-children by the foot with a string, to save them from rolling into the water. They feed their horses and their other beasts upon fish, which abound in the lake to such a degree, that a man has only to open his trap-door, and to let down a basket by a rope into the water, and then to wait a very short time, when he draws it up quite full of them. The fish are of two kinds, which they call the paprax and the tilon." The lake Prasias of the father of history seems to be the modern lake Takinos, on the Strymon or Kara-su, a river which, rising on the borders of Bulgaria, flows southward through Roumelia, and, after expanding its waters into a lake, falls into the gulf of Contessa. The fish named by Herodotus have not been identified by naturalists; lake Takinos abounds in carp, tench, and eels.

The island-dwellings of lake Prasias met with comparatively little attention until archæologists, quite recently, found the remains of similar habitations in other parts of Europe. The first discovery was made in Ireland in 1839, by Mr. W. R. Wilde, one of the secretaries of the royal Irish academy. The small lake of Lagore, near Dunshaughlin, in the county of Meath, having been drained, a circular mound which had been an island in its waters, was observed to be thickly strewed with bones. As these were to be carted away for manure, it was found to be an artificial structure. Its circumference, measuring 520 ft., was formed by upright piles of oak about 7 ft. long, mortised into oak planks laid flat upon the marl and sand at the bottom of the lake. The upright piles were tied together by cross-beams, and the space which they inclosed was divided into compartments by oak beams, some of which had grooves, so as to allow panels to be driven down between them. The compartments thus formed were filled with bones and black peaty earth. Portions of a second tier of upright piles were observed rising from the first tier. The bones were ascertained to be those of several varieties of oxen, of swine, deer, goats, sheep, dogs, foxes, horses, and asses. Along with them were found a vast number of weapons, ornaments, and utensils, fashioned of stone, bone, wood, bronze, and iron; such as swords, knives, spears, javelins, daggers, whetstones, querns (or hand-mills), beads, pins, brooches, combs, horse-trappings, shears, chains, axes, pots, and bowls. On reference to the ancient annals, in which Ireland is so rich, it was seen that, in 848 A.D., a hostile Irish chief "plundered the island of loch Gabhor [as Lagore was then written], and afterwards burned it, so that it was level with the ground;" and that again, in 933 A.D., "the island of loch Gabhor was pulled down" by the piratical Norsemen.

Mr. Wilde's discovery at Lagore was followed by other discoveries of the same kind elsewhere in Ireland, so that in 1857 the existence of about 50 C. had been ascertained; and every succeeding year had seen an increase of the number. They show several varieties of construction. The island at Lagore is a type of the purely artificial crannoge. But most frequently the crannoge was partly natural. An islet just level with the water, was raised artificially a foot or two above it. An islet too small to be a convenient habitation, or too easy of landing to be a place of defense, had its area artificially enlarged, or its banks artificially strengthened, generally by piles or stockades, but occasionally by heaps of stones. The space thus inclosed is generally a circle of from 60 to 80 ft. in diameter; but in some cases the inclosed space is larger, and of an oval shape. The piles are generally of oak, mostly young trees, from 4 to 9 in. broad, still bearing marks of the hatchet; usually a single row has been considered enough, but there are instances of two, and even of three rows. It would seem that originally the piles had risen several feet above the water, and it has been supposed that they were interlaced with branches placed horizontally, so as to form a screen or breastwork. The area within the stockade is sometimes wholly or partially covered with a layer of round logs, from 4 to 6 ft. long, having stones, clay, or gravel above them. Fragments of oak-framing, with mortises and cheeks cut in them, have been found within the piles. In almost every instance, a few flat stones, apparently serving as a hearth, have been observed near the middle of the inclosure; in several C., two or three hearths have been met with. In some cases, a causeway leads from the island to the mainland; but in general the crannoge was to be reached only by boat, and scarcely any crannoge has been discovered without the remains of a primitive canoe, hollowed out of the trunk of an oak, being found beside it. In at least one crannoge, a pier or jetty projected from the island; it was a double row of piles and stretchers, running parallel to each other at a distance of about 8 ft., and supporting a platform of logs. On almost every crannoge one or two querns (q.v.) have been found, along with bones of oxen, deer, goats, and swine, horns of cattle, deer, sheep, and goats, boars' tusks, and sharpening stones; fragments of pottery, and articles of stone, bone, horn, wood, glass, copper, bronze, brass, and iron, are of somewhat rarer occurrence. Many of the C. had been submerged by the gradual rise of the lakes in which they stood, so that their existence only

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became known as the great drainage-works of late years reduced the waters to their old level.

In a section of the crannoge in Ardakillin lough, near Stokestown, in the county of Roscommon, the upper surface of the crannoge was formed of a layer of loose stones, surrounded by a wall, partly supported by piles. The stones rested on the natural clay, peat, and boulders of the island, in digging through which strata of ashes, bones, and logs of timber were met with. The stockades were of oak; the oblique or slanting stockade is a girdle of sheet-piling which quite encircled the crannoge.

Of one of two C. in Drumaleague lough, in the county of Leitrim, the circle within the ring of stockades is 60 ft. in diameter; in some places there are two, and in others, three rows of stockades; and within this outer ring, there are groups of piles, some of them arranged apparently for some special purpose. The oblong space in the middle, marked A, is covered by a rude platform of round logs, chiefly of alder, from 4 to 6 ft. in length; it was probably the floor of the log-house, which was the chief or only dwelling-place on the islet. B shows where the hearth stood—a collection of stones, still retaining traces of fire; C marks a heap of stiff clay; D, the root of a large tree nearly buried in the peat, the surface of the wood being beveled off with a hatchet, so as to form a sort of table, under which was found a heap of bones, apparently of deer and swine.

The Irish annals, it has been seen, make mention of C. as early as the 9th c., and they figure in history down to the middle of the 17th century. The crannoge of lough Lynch, in Antrim, is shown as the birthplace of Colkitto, a chief who figured in Montrose's wars, and has found a place in one of Milton's sonnets. The crannoge of Roughan lake, near Dungannon, was the last retreat of sir Phelim O'Neil in 1641. Two years later, there is record of an attempt to flood the crannoge of Loughinsholin, in the county of Londonderry, by turning a stream into the lake, and damming up its outlet. This attempt failed; but in 1645 the garrison were compelled by hunger to give the crannoge to the flames, and make their escape. In 1567, an agent of the English government, who was asked what were the castles of the O'Neil, wrote in reply: "For castles, he trusteth no point thereunto for his safety, as appeareth by the razing of the strongest castles of all his countries; and that fortification that he only dependeth upon is in certain fresh-water lochs in his country, which from the sea there comes neither ship nor boat to approach them: it is thought that there, in the said fortified islands, lieth all his plate (which is much), and money, prisoners, and gages [i.e., hostages]; which islands have in wars heretofore been attempted, and now of late again by the lord-deputy there, sir Harry Sydney, which for want of means for safe conduct upon the water hath not prevailed."

While archæologists were still exploring the C. of Ireland, structures of a similar kind were discovered in the heart of the European continent. The winter of 1853–54 was one of the driest that had been seen in Switzerland, and the lakes sank to a lower level than was ever known before. The inhabitants of the village of Meilen, on the lake of Zurich, took advantage of this unusual subsidence to reclaim a piece of land from the lake. As the work went on, a learned antiquary, Dr. Ferdinand Keller, discovered the remains of rows of deeply driven piles, and, imbedded in the mud around them, found heaps of primitive weapons, tools, and utensils, made of stone and bone. Closer examination satisfied him that the piles had supported a platform; that on this platform huts had been raised; and that after being thus occupied, probably for centuries, the structure had been destroyed by fire. The discovery in the lake of Zurich of these *Keltische pfahlbauten* (Celtic pile-buildings), as Dr. Keller called them—*habitations lacustres* (lake-dwellings), as other Swiss archæologists have termed them—was followed almost immediately by the discovery of erections of the same kind in other lakes of Switzerland. No fewer than from 30 to 40 have been found in the upper and lower lakes of Constance; as many as 30 in the lake of Geneva; more than 20 in the lake of Neuchâtel; 10 in the lake of Bienne; besides others in the deep peat-bogs which surround the hill of Chamblon, in the Vallée de l'Orbe, and in the lakes of Morat, Inkwyl near Soleure, Moosseedorf near Bern, Pfaffikon near Zurich, Wauwyl near Lucerne, and Nussbaumen in the canton of Thurgau. The site chosen for these lake-dwellings was generally a sunny and sheltered bay, with a gently shelving bottom of mud or clay. The piles, from 4 to 10 in. in diameter, were rudely fashioned of whatever wood was at hand, oak, fir, ash, beech, birch, cherry, or apple. They were driven in a depth of not less than 6 or 7 ft. of water, at a distance of from 100 to 300 ft. from the shore. They were ranged generally from 1 to 2 ft. apart, in the form of a narrow parallelogram, having its longest side in a line with the edge of the lake. At Wangen, on the lower lake of Constance, the piles, from 30,000 to 40,000 in number, extend about 700 paces in length, and about 120 in breadth. At Morges, on the lake of Geneva, the piles stretch 1200 ft. in length by 120 ft. in width, so that they would have supported a platform with an area of about 18,000 ft., sufficiently capacious, according to the calculations of M. Frederic Troyon of Lausanne, to contain 316 huts, with a population of 1264 persons. The huts, it would seem, were for the most part circular in shape, measuring from 10 to 15 ft. in diameter; they were of wattles, plastered with clay, masses of which hardened by fire, still bearing the marks of the wattles which it had received when wet and soft, have been recovered from the beds of the lakes. In at least one instance, the remains of a bridge or gang-

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way, leading from the platform to the shore, have been discovered. Many small boats, hollowed out of the trunks of trees, have been found; and one large vessel of the same kind, 50 ft. long, and 3½ ft. wide, has been observed at the bottom of the lake of Bienne.

The lake-dwellings of Switzerland have obviously much more resemblance to those of lake Prasias, described by Herodotus, than to the C. of Ireland. But the Swiss at the same time can show examples of the Irish type. At Nidau Steinberg, in the lake of Bienne, there is an artificial mound of stones, resting on horizontal planks, and encircled by a row of upright piles. It is now submerged, but when—as the Swiss believe—the lake stood at a lower level, it must have been an island. At Moringen, in the same lake, there is another pile-building, inclosing a mound of stones which has an area of about half an acre. A canoe which had been used in its construction lies with its load of stones at the bottom of the lake. Structures still more nearly resembling the Irish C. have been found in the lakes of Inkwyl, Nussbaumen, and Wauwyl.

History and tradition are alike silent as to the pile-buildings of the Swiss lakes. That they belong to a remote age, will readily be granted, even by those who may hesitate to accept "the stone, bronze, and iron periods" on which the Swiss antiquary rests their claims to "pre-historic" antiquity; or who may question the grounds on which the Swiss naturalist assigns them to the 15th c. before the Christian era. Of the remains found in them, many appear to be those of a rude people—such as spear-points, arrow-heads, axes, chisels, knives, and even small saws, of flint and stone; arrow-heads, daggers, hammers, bodkins, needles, pins, rings, bracelets, necklaces, of bone or horn. Articles of bronze, some of them richly ornamented, are at the same time of common occurrence; and swords and other objects of iron are met with in considerable numbers. Some of the Swiss archæologists seem at one time to have thought that the piles surrounded by stone and bone implements showed marks of greater age than the piles surrounded by bronze implements. It is now admitted, however, that both stone and bronze objects, and bronze and iron objects, are to be found in the same group of piles. It is to be remarked, too, that many of the objects of stone, bone, horn, bronze, and iron, are fashioned of the same shape, and for the same use, differing only in the substance of which they are made. Whoever the dwellers on the *pfahlbauten* were, their remains show that they grew wheat and barley; that they ate the flesh of the ox, the goat, the sheep, and the pig; that among the beasts of the chase which they hunted down was the now extinct species of the aurochs (see Bison); that they had horses, dogs, and cats; that they had apples, pears, wild-plums, and wood-raspberries; that they baked pottery; that their women plied the distaff and knitted; that they made hempen mats; and that they wove linen cloths.

Hitherto, archæologists knew of lake-dwellings as existing only in Ireland and Switzerland; but in 1857, Mr. Joseph Robertson read a paper to the society of Scottish antiquaries, proving that they were to be found in almost every province of Scotland. He not only ascertained the existence of about 50 examples, but was able to show from records that they were known in Scotland by the same name of C. which they received in Ireland. The resemblance between the Scottish and Irish types seems, indeed, to be complete. Every variety of structure observed in the one country is to be found in the other, from the purely artificial island, framed of oak-beams, mortised together, to the natural island, artificially fortified or enlarged by girdles of oak-piles or ramparts of loose stones; from the island with a pier projecting from its side, to the island communicating with the mainland by a causeway. If there be any difference between the C. of the two countries, it is that the number of C. constructed altogether of stones is greater in Scotland than in Ireland—a difference which is readily explained by the difference in the physical circumstances of the two countries. Among the more remarkable of the Scotch C. is that in the loch of Forfar, which bears the name of St. Margaret, the queen of king Malcolm Canmore, who died in 1097. It is chiefly natural, but has been strengthened by piles and stones, and the care taken to preserve this artificial barrier is attested by a record of the year 1508. Another crannoge—that of Lochindorb, in Moray—was visited by king Edward I. of England in 1303, about which time it was fortified by a castle of such mark that in 1336, king Edward III. of England led an army to its relief through the mountain-passes of Athol and Badenoch. A third crannoge—that of Loch Cannor, or Kinord, in Aberdeenshire—appears in history in 1335, had king James IV. for its guest in 1506, and continued to be a place of strength until 1648, when the estates of parliament ordered its fortifications to be destroyed. It has an area of about an acre, and owes little or nothing to art beyond a rampart of stones and a row of piles. In the same lake there is another and much smaller crannoge, which is wholly artificial. Forty years after the dismantling of the crannoge of loch Cannor, the crannoge of Lochan-Eileen, in Strathspey, is spoken of as "useful to the country in time of troubles or wars, for the people put in their goods and children here, and it is easily defended." Canoes hollowed out of the trunks of oaks have been found as well beside the Scotch, as beside the Irish crannoges. Bronze vessels, apparently for kitchen purposes, are also of frequent occurrence, but do not seem to be of a very ancient type. Deer's horns, boars' tusks, and the bones of domestic animals, have been discovered; and in one instance a stone hammer, and in another what seem to be pieces for some such game as draughts or backgammon, have been dug up.

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Since 1857, the existence of lake-dwellings has been discovered in Savoy, in upper Italy, in Hanover, in Prussia, and in Denmark. Less certain traces have been found in England, in draining a mere at Wretham Hall, near Thetford, in Norfolk. The savages of Borneo and New Guinea still live on the water, in huts perched upon platforms supported by piles; and wooden houses raised upon piles are common in Burmah and Siam, on the creeks and rivers of the strait of Malacca, and it is believed elsewhere in Asia. A bass-relief from the palace of Sennacherib, engraved in Mr. Layard's *Monuments of Nineveh*, represents what seem to be artificial islands.

The C. of Ireland are described in the *Proceedings of the Royal Irish Academy*, vols. i., v., vii.; Mr. Wilde's *Catalogue of the Museum of the Royal Irish Academy; The Archæological Journal*, vols. iii., vi.; Mr. Digby Wyatt's *Observations on the Early Habitations of the Irish* (Lond. 1858); *The Ulster Journal of Archæology*, No. 26; *Proceedings of the Kilkenny Archæological Society*, No. 27. The chief works on the lake-dwellings of Switzerland are Dr. Ferdinand Keller's three papers on *Pfahalbauten*, and Dr. L. Rutimeyer's *Untersuchung der Thierreste aus den Pfahlbauten*, all published in the *Mittheilungen der Antiquarischen Gesellschaft in Zurich*, band ix., xii., xiii.; M. Frederic Troyon's *Habitations Lacustres de la Suisse* (Lausanne, 1857); his *Ossemens et Antiquités du Lac de Moossedorf*, in the *Bibliothèque Universelle de Genève*, for May, 1857; his *Details of Discoveries at the Lake Habitations of Switzerland*, in the *Ulster Journal of Archæology*, No. 29; MM. Alb. Jahn and J. Uhlmann's *Die Pfahlbau-Alterthümer von Moossedorf* (Bern, 1857); and M. A. Morlot's *Etudes Géologico-Archéologiques en Danemark et en Suisse*, in the *Bulletin de la Société Vaudoise des Sciences Naturelles*, t. vi. (Lausanne, 1860).

CRANSTON, a t. in Providence co., R. I.; incorporated in 1754; on the New England railroad; 4 m. s. of Providence; pop. '90, 8099. The people are largely engaged in the manufacture of cotton and machinery.

CRANWORTH, Robert Monsey Rolfe, Baron, 1790–1868; an English jurist, educated at Cambridge and called to the bar in 1816. He was in parliament from 1832 to 1839, and at the same time solicitor-general. In 1850 he was made vice-chancellor, and in 1865–66 again held the same office.

CRAPE, a thin fabric made of raw silk, which has been tightly twisted, without removing the viscous matter with which it is covered when spun by the worm. It is simply woven as a thin gauze, then dressed with a thick solution of gum, which in drying causes the threads partially to untwist, and thus gives a wrinkled and rough appearance to the fabric. It is usually dyed black, and used for mourning apparel.

CRAPO, William Wallace, b. Dartmouth, Mass., 1830; graduated at Yale coll., 1852; studied law and practiced in New Bedford; was a member of the state legislature, 1857, and a republican representative to congress, 1875–82.

CRAPS. See Oontz.

CRAS-CROM, an ancient and rude instrument of agriculture in the Highlands, consisting, as its name in Gaelic imports, of a crooked stick shod with iron, with a small projecting bar to rest the foot upon.

CRASHAW, Richard, an English poet, whose devotional strains exhibit imagination of a high order, with great copiousness and beauty of language, was the son of a clergyman in the English church, and was b. in London, 1612 or 16. He was educated at the Charter-house, and at Cambridge, where he obtained a fellowship in 1637. He entered the church about 1641, it is said, and became an earnest and eloquent preacher; but in 1644 he was ejected from his fellowship by the parliament for refusing to take the covenant. He went to France, adopted the Roman Catholic faith, and suffered great pecuniary distress, until, through Cowley's influence, he was introduced to queen Henrietta Maria, who recommended him to certain dignitaries of the church in Italy. He soon obtained a secretaryship to one of the cardinals at Rome, and was made a canon of the church of Loretto. In this office he died 1649. In 1634, C. published a volume of Latin poems, in which appeared the famous line, sometimes attributed to Dryden and others, relative to the miracle of the water being turned into wine.

"*Nympha pudica Deum vidit et erubuit.*"
"The modest water saw its God and blushed."

In 1646 appeared his *Steps to the Temple, the Delights of the Muses*, and *Carmen Deo Nostro*, in which there is much fervid poetry. C. greatly resembles George Herbert in his cast of thought, and is not inferior to him in richness of fancy, though we find in him more exaggeration and conceit.

CRASIS. See Orthography, Figures of.

CRASSULA'CEÆ, a natural order of exogenous plants, some of them shrubby, and some herbaceous, all remarkable for their succulency. About 300 species are known, among which are house-leeks, stone-crops, rose-root, etc. They are widely distributed over the world, but South Africa particularly abounds in them. Most of them grow in dry places, and derive their nourishment from the air rather than from the soil, their

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roots seeming chiefly intended to fix them to the spot. Many of them are much cultivated in greenhouses, more on account of their grotesque forms than for the beauty of their flowers. Some are refrigerant, and one or two are even used as food; others, on account of the tannin which they contain, are astringent; and some are acrid.

CRAS'SUS, the surname of several old Roman families, among which that of the Licinii was most remarkable.—CRASSUS (LUCIUS LICINIUS), b. in 140 B.C., was the best orator of his age, and was as distinguished for his wit as for his rectitude in the capacity of proconsul. In 95 B.C. he was elected consul, along with Quintus Mucius Scævola (who had been his colleague in all his previous offices). During their consulship was enacted the *Lex Licinia Mucia de Civibus regundis*, banishing from Rome all who had not the full rights of citizens. This imbittered the feelings of foreigners toward Rome, and partly led to the social war. As censor, C., 92 B.C., closed all the schools of the rhetors—asserting that they had exercised a bad influence on the minds of young men. In consequence of the excitement attending a debate in the senate, C. died in 91 B. C.

CRASSUS, MARCUS LICINIUS, the triumvir, was born sometime before 115 B.C. His father and brother suffered death from the party of Marius, 81 B.C., and he himself—though young—was subjected to a jealous and dangerous surveillance. In 85 B.C., to escape from this, he went to Spain. He afterwards joined Sulla (83 B.C.), and distinguished himself in the battle against the Samnites at the gates of Rome. As prætor he crushed the Servile revolt, by the conquest of Spartacus at the battle of Lucania (71 B.C.), and in the following year was made consul with Pompey, a colleague whom he hated. On the other hand, Cæsar valued the friendship of C., the most wealthy of Roman citizens. During his consulate, C. gave a feast to the people, which was spread on 10,000 tables, and distributed a provision of corn for three months. Plutarch estimates the wealth of C. at more than 7,000 talents, and Pliny states that the lands of C. were worth 8,000 talents. About 60 B.C., Cæsar, Pompey, and C. entered into a private arrangement for their common benefit. This paction is known as the first *triumvirate*. See CÆSAR. In 37 B.C., as consul with Pompey, he gained the province of Syria, and professed to make preparations of war against the Parthians; but the acquisition of more wealth seems to have been his main object, and this he effected by plundering the towns and temples in Syria. At length, however, he set out, but was misguided by a treacherous Arab, and utterly defeated at the river Bilecha by the Parthians. C. now retreated to the town of Carrhæ, intending to pass into Armenia; but was beguiled into a conference with the Parthian gen., Surenas, and was slain at the appointed place of meeting. His quæstor, Cassius, with 500 cavalry, escaped into Syria; but the remaining Romans were scattered and made prisoners, or put to death.

CRATAE'GUS, a genus of plants of the natural order *rosaceæ*, sub-order *pomeæ*, very nearly allied to *mespilus* (medlar) and *pyrus* (pear, apple, etc.), but distinguished by the acute calycine segments, and by the round or oval fruit, closed at the apex, and concealing the upper end of the bony cells. The species are pretty numerous, natives of the temperate parts of the northern hemisphere, and in general have flowers in beautiful terminal corymbs. They are all large shrubs or small trees, more or less spiny, whence the name THORN has been very generally applied to them. The only native of Britain is the common hawthorn (q.v.), (*C. oxyacantha*). Most of the species resemble it considerably in habit, size, form of leaf, etc. A number of them are now frequent in plantations and shrubberies in Britain, of which perhaps the most common is the COCK'S-SPUR THORN (*C. crus-galli*, a native of North America from Canada to Carolina. Its leaves are not lobed; its fruit rather larger than that of the hawthorn. The AZAROLE (*C. azarolus*), a native of the s. of Europe, and the ARONIA (*C. aronia*), a native of the Levant, are occasionally cultivated for their fruit, which is about the size of the Siberian crab, and is used either for dessert or for pies. *C. orientalis* (or *odoratissima*) and *C. tanacetifolia* have also fruit of considerable size. The latter is much eaten in Armenia. *C. Mexicana* has a large fruit, like a small apple, but not eatable. It is, however, very ornamental. The wood of most of the species much resembles that of the hawthorn. It is common to graft the rarer species on the hawthorn.

CRATCH CRADLE, also called CAT'S CRADLE and SCRATCH CRADLE (*cratch* being a crib or manger), a game played by two persons holding an endless string symmetrically in the fingers of the two hands, and taking it off each other's hands, so as to form a new pattern at once. The game is played principally by children.

CRA'TER (Gr. a cup), the central cup-shaped cavity in the summit of a volcano (q.v.), through which the lava, stones, scoria, etc., are for the most part ejected. These materials sometimes escape from immense rents in the sides of the volcano, as was the case in the famous eruption of Hecla in 1783, when two enormous streams of lava poured from its side to the distance, the one of 40, the other of 50 miles. Nor are the volcanic materials, when they escape through a crater, always ejected through the old vent on the summit; some other portion of the mountain may yield more readily to the pressure from within, and thus one or more lateral craters be formed, which, however, increase in height from the accumulation of ejected materials, and eventually, if the eruption continues, overtop the former cone.

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CRAT'ERUS, a gen. of Alexander the Great, killed in battle with Eumenes 321 B.C., two years after Alexander's death. On the division of the empire, Craterus and Antipater received jointly the government of Macedonia, Greece, Illyria, and Epirus, Antipater taking command of the military forces and Craterus attending to civil affairs.

CRA'TES, an Athenian actor and writer of comedies in the 5th c. B.C. His plays were remarkable for not depending on political points for success, as had been common; and he was the first one to introduce a drunken character on the stage, where the inebriate individual has since remained as a frequent feature.

CRA'TES, a cynic philosopher of Thebes, of the 4th c. B.C., a pupil of Diogenes, rivaling even his master in cynicism. His large fortune he placed in charge of a banker, with orders that if his sons should turn out to be fools the property should go to them; but if they should become philosophers it should be given to the poor. Crates wrote a number of philosophical letters.

CRA'TES, a Greek grammarian and Stoic philosopher of the 2d c. B.C., leader of a literary school, and chief of the library of Pergamus. Little is known of his life except the event of his visiting Rome 157 B.C., as ambassador of Attalus II., king of Pergamus, which event led him to study Latin grammar. He wrote on agriculture, geography, and a treatise on the Attic dialect.

CRATI'NUS, a Greek comic poet, about 520–423 B.C. Next to his younger contemporaries, Eupolis and Aristophanes, he is the most valuable representative of the old Attic comedy. He changed its outward form considerably, and also sought to add to its vigor and power. Before his time, the number of actors had been indefinite; he limited them to three. He was the first to make comedy pungent and personal. The habits, manners, institutions—in fact, the whole public and private life of the Athenians—were considered by C. a legitimate mark for censorious satire. The greatest men did not escape. Pericles, for instance, was frequently and fiercely abused. C.'s style was very metaphorical and ingenious. Of his twenty-one comedies, nine of which obtained the first prize in the public competitions, we possess only some fragments. These have been collected by Meineke in his *Fragmenta Comicorum Græcorum* (Berlin, 1840).

CRATIP'PUS, a peripatetic philosopher, was a native of Mitylene, and a contemporary of Cicero. He appears to have been held in the highest estimation by the great men of his age. Cicero calls him the prince of all the philosophers whom he had known. Pompey visited him after his defeat at Pharsalia, and received at his hands the consolations of philosophy; and Brutus went to Athens, to which city C. had lately betaken himself, to listen to his prelections, even while making preparations to meet Octavius and Antony. Nothing that C. wrote has survived.

CRAVEN, a co. in s.e. North Carolina, bordering on Pimlico sound, and intersected by the Neuse river and the Atlantic and North Carolina railroad; 792 sq. m.; pop. '90, 20,534, includes colored. Co. seat, Newbern.

CRAVEN, ALFRED WINGATE, civil engineer, 1810–79; b. Washington, D. C.; was made engineer commissioner, New York, 1849. His connection with the Croton water board was remarkable for the number and value of the works which he projected and superintended. Among these were the Central Park reservoir, completed in 1867, the reservoir at Boyd's Corners, and the survey of the Croton valley. The establishment of the sewerage system of New York is largely due to his endeavors. He was the first pres. of the American soc. of civil engineers.

CRAVEN, THOMAS TINGLEY, 1808–87; b. Washington, D. C.; entered the U. S. navy, 1822; took part in the capture of the pirate *Federal*, West Indies, 1828; commanded Capt. Wilkes's flagship in the antarctic exploring expedition, 1838; participated in the capture of New Orleans, and the operations on the Mississippi; was promoted rear-admiral, 1886; and subsequently commanded the Mare island navy yard, and the Pacific squadron.

CRAVEN, TUNIS AUGUSTUS MACDONOUGH, 1813–64; b. Portsmouth, N. H.; entered the U. S. navy, 1829; took part in the conquest of California; made a survey for a Darien ship-canal, 1857; saved the fort at Key West for the government, 1861; commanded the monitor *Tecumseh* under Farragut at Mobile, 1864; and while there chasing the confederate ram *Tennessee*, his vessel struck a torpedo, and sank with himself and nearly every one on board.

CRAWFORD, a co. in w. Arkansas, on the border of the Indian territory, bounded s. by Arkansas river; 582 sq. m.: pop. '90, 21,714. Co. seat, Van Buren.

CRAWFORD, a co. in s.w. Georgia, on Flint river, intersected by the Southwestern railroad; 324 sq. m.; pop. '90, 9315, includes colored. Co. seat, Knoxville.

CRAWFORD, a co. in s.e. Illinois, separated from Indiana by the Wabash river; 452 sq. m.; pop. '90, 17,283. Co. seat, Robinson.

CRAWFORD, a co. in s. Indiana, bordering on the Ohio river, and watered by the Little Blue; 270 sq. m.; pop. '90, 13,941. Co. seat, English.

CRAWFORD, a co. in w. Iowa, intersected by Boyer river, and the Chicago and Northwestern railroad; 720 sq. m.; pop. '90, 18,894. Co. seat, Denison.

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CRAWFORD, a co. in s.e. Kansas, on the Missouri border, watered by the head streams of Neosho river, and intersected by the Atchison, Topeka, and Santa Fé and other railroads; 592 sq. m.; pop. '90, 30,286. Co. seat, Girard.

CRAWFORD, a co. in Michigan on the upper waters of Au Sable river; 580 sq. m. Pop. '90, 2962. Co. seat, Grayling.

CRAWFORD, a co. in s.e. Missouri, intersected by the Maramec river and the St. Louis and San Francisco railroad; 710 sq. m.; pop. '90, 11,961, includ. colored. Co. seat, Steelville.

CRAWFORD, a co. in n. central Ohio, watered by the head streams of Sandusky river, and intersected by the Ohio Central lines and other railroads; 393 sq. m.; pop. '90, 31,927. Co. seat, Bucyrus.

CRAWFORD, a co. in n.w. Pennsylvania on the Ohio border, watered by French Creek, and intersected by the New York, Lake Erie and Western, and the Pittsburg, Shenandoah, and Lake Erie railroads; 1010 sq. m.; pop. '90, 65,324. Co. seat, Meadville.

CRAWFORD, a co. in s.w. Wisconsin, on the Mississippi river, bounded s. by the Wisconsin, and intersected by Kickapoo river, and the Chicago, Milwaukee and St. Paul and the Burlington route railroads; 535 sq. m.; pop. '90, 15,987. Co. seat, Prairie du Chien.

CRAWFORD, Francis Marion, b. Lucca, Italy, 1854; the son of Thomas, the sculptor. Although he has made short visits to this country, the greater part of his life has been spent abroad. He has written a number of romances, including *Mr. Isaacs*, *Dr. Claudius*, *A Roman Singer*, *To Leeward*, *An American Politician*, *Greifenstein*, *Khaled*, *The Witch of Prague*, *Katharine Lauderdale*, *The Ralstons*, *Saracinesca*, *Pietro Ghisleri*, *Casa Braccio*, *The Novel*, *What It Is*, *Adam Johnstone's Son*, etc.

CRAWFORD, Nathaniel Macon, D.D., 1811–71; b. Ga.; graduated at Franklin university. He studied law, and was admitted to the bar, but never practiced. In 1837, he was chosen professor of mathematics in Oglethorpe university; licensed to preach in 1843, and ordained the next year, becoming pastor of a Baptist church. In 1847, he was chosen professor of biblical literature in Mercer university, and in 1854 he became president of that institution. In later years he filled chairs in the Western Baptist theological seminary and the university of Mississippi, returning to the presidency of Mercer university in 1858. A year later he was chosen president of the Bible revision association. He published *Christian Paradoxes*.

CRAWFORD, Thomas, 1814–57; an American sculptor; b. New York. At the age of 22 he went to Rome and became a pupil of Thorwaldsen. The first work which brought him prominently into notice was his "Orpheus entering Hades in Search of Eurydice," finished 1839. This was followed by other poetical compositions, such as "Babes in the Wood," "Flora," "Hebe and Ganymede," "Sappho," "The Dancers," and "The Hunter." Among his works are a bust of Josiah Quincy; a statue of Washington at Richmond, Va.; of Beethoven, in the Boston music hall; of Dr. Channing; of Henry Clay; and the colossal figure of "Liberty" (in armor) for the capitol at Washington. For this building he also executed the pediment and bronze doors. During his later years he suffered from tumor of the brain, which deprived him of sight, so that he was compelled to leave many works unfinished.

CRAWFORD, William Harris, 1772–1834; b. Va., but removed with his family to Georgia when a child. He was self-educated, and in 1798 was admitted to the bar. In 1802, he was chosen a member of the state senate, in which body he presented a resolution, which was adopted by both houses of the legislature, requesting Mr. Jefferson to permit his name to be used as a candidate for a third term of the presidency. In 1807, he was chosen to fill a vacancy in the United States senate. During the canvass, he fought two duels, killed one man, and was wounded in the next venture. He was re-elected to the senate in 1811, and in 1812 was chosen president *pro tempore* when George Clinton, the vice-president, was disabled by sickness. He at first opposed, but finally supported the war with England. In 1813, he was appointed minister to France, where he became one of La Fayette's friends. In 1815, he was made secretary of war, and the next year secretary of the treasury. Crawford thought himself entitled to succeed Monroe as president, and was nominated by a congressional caucus, which was then the regular way; but this caucus system had grown odious, and there were four other candidates against him, Calhoun, Adams, Jackson, and Clay. Calhoun was pacified with the vice-presidency, to which he was chosen by 182 out of 261 votes. There was no choice for president, the vote being: Jackson, 99; J. Q. Adams, 84; Crawford, 41; Clay, 37. About the time of the election, Crawford was stricken with paralysis, a disease from which he never recovered. His condition rendered it impossible to consider him a candidate when the election came to be decided in the house of representatives, although even in such a condition he got four of the 24 votes. From this time Crawford was out of the political field. In his own state, he was made a judge, filling the office until his death.

CRAWFORD, William Henry, educator, b. in Will co., Ill., 1855, graduated at the Northwestern University and became a minister in the Methodist Episcopal church. He was appointed Professor of Historical Theology in the Gammon theological

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seminary, Atlanta, Ga., 1889, and in 1891 spent several months in Europe gathering material for a series of lectures on the reformers before the Reformation. In 1893 he was appointed President of Allegheny College.

CRAWFORDSVILLE, city, and co. seat of Montgomery co., Ind., 44 m. n.w. of Indianapolis, reached by several railroads. The city is in a fine agricultural region, and is the seat of Wabash College, a large educational institution under the care of the Presbyterians. It has foundries, planing, and flour mills, elevators, electric light, natural gas, water works, high school, national banks, and daily, weekly, and other periodicals. Pop. '90, 6089.

CRAYER, CASPAR DE, a Flemish historical and portrait painter, was b. at Antwerp in 1584. He lived first at Brussels, and afterwards at Ghent, where he died in 1669. For the churches at Ghent he executed 21 altar-pieces. His works are to be found all through Flanders and Brabant. The galleries of Vienna and Munich also possess a few. Their main characteristics are vigor and boldness of design, and care and truthfulness in execution. Rubens was a great admirer of Crayer.

CRAY'FISH, or CRAW'FISH (*Astacus fluviatilis*), a crustacean of the order *decapota* (see CRAB), sub-order *macroura* (i.e., long-tailed—characterized by the elongation of the abdomen, and its termination in a sort of fin composed of five pieces and expanded laterally); nearly allied to the lobster, from which, however, it differs in having the middle plate of the tail-fin transversely divided by a suture. It inhabits the rivers and streams of many parts of Europe, and is common in some of those of America, making burrows in clayey banks, and coming forth at night in search of food, which consists chiefly of mollusks, small fishes, larvæ of aquatic insects, and animal substances of almost any kind. It is esteemed for the table, and is readily attracted by a bait of decaying flesh or animal garbage, which being inclosed in a net or in a bundle of twigs, numbers of C. may be captured at a time.—Other species of C. abound in some of the warmer parts of the world. See illus., CRUSTACEANS, vol. IV.

CRAYON (Fr. a pencil). Though used in French, and occasionally in English, to designate pencils generally, including those made of lead, the word C. is more frequently applied, in America, to those small cylinders of charcoal, or of pipe-clay or chalk colored with various pigments, which are used for drawing. Cohesiveness is given to the paste of which the cylinders are formed by means of gum, wax, soap, etc. C. drawings are often remarkable for the delicacy and softness with which objects are represented, but they are deficient in power. See CHALK; PENCILS.

CREAM, the butyraceous and richer portion of milk, which, being lighter, rises and settles on the surface. See MILK. The term C. is applied in a variety of ways, indicative of something superior in quality; as *cold cream* (q.v.), and *cream of the valley*, a fine kind of English gin. The French, in referring to persons in the height of fashion, speak of *la crême de la crême*—the cream of cream.

CREAM OF TARTAR exists naturally in grape juice, but being insoluble in alcohol, it is gradually deposited, in the form of argol, as the sugar of the juice becomes converted into alcohol by fermentation. In the preparation of C. of T., the argol is dissolved in hot water, to which charcoal or fine clay is added, to take up the coloring matter; by boiling and filtering, a clear colorless solution is obtained, from which, on cooling, the C. of T. separates as crystals. Some of the crystals form at the bottom; others form a crust on the top, like cream, whence the name, cream of tartar. In chemical composition, it is the bitartrate of potash, $KHC_4H_4O_6$, and contains potash, water, and tartaric acid. It is readily soluble in hot water, though it takes 60 parts of cold water to dissolve one part of the cream of tartar. It has an acid taste, and gritty feel. When taken repeatedly in small doses of a scruple to a dram, it acts as a refrigerant and diuretic; in doses of one to two drams, it is useful as an aperient; and in larger doses of from two to three drams, it acts as a purging agent, accompanied by flatulence and griping.

CREAM WARE. See WEDGWOOD WARE.

CREASOTE (CREOSOTE) is an artificial organic substance obtained by a complicated process of separation from wood-tar, generally beechwood tar. The name, however, is often applied commercially to a similar product of coal-tar, which is either crude carbolic acid or a mixture of substances resembling carbolic acid. Wood-tar C. is a mixture in varying proportions of cresol, creasol guaiacol, and other substances. "Wood tar is a colorless or pale yellow, transparent, somewhat oily, and strongly refractive liquid, of a peculiar persistent odor, resembling that of smoked meat, and of a caustic, pungent taste; it is neutral in reaction, does not decompose by exposure to the air and light; but absorbs moisture and becomes in time yellowish or reddish. It is combustible and burns with a sooty flame." Its specific gravity is from 1.035 to 1.085, its boiling point, 397.4° F., but it does not deposit crystals at 16.6° F. as carbolic acid does. It dissolves slightly in water, but freely in alcohol, ether, and many other organic solvents; it is itself a powerful solvent for phosphorus, sulphur, resins, fats. According to Hoffman and Power it does not coagulate albumen or collodion. It is a strong antiseptic, and wood smoke and wood vinegar owe their preservative action in part, at least, to the C. which they contain. C. is said to be less caustic than carbolic acid and less likely to produce disintegration in animal matters to which it has been applied as a preservative. C. is applied to the preservation of wood (q.v.), and of meat.

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It is used also in medicine for its local action, internally and externally. It is said to act as a powerful paralyzant of nerve tissue, and in doses of 1 to 3 drops has value in controlling nausea, vomiting, and diarrhœa in conditions due to non-inflammatory irritation; it also checks excessive secretion in the air-passages It is applied to carious teeth for the destruction of the nerves. In overdoses it is poisonous, producing giddiness, obscuration of vision, convulsions, coma, and sometimes death. There is no special antidote; emetics and stimulants are used. In many of its applications it has been supplanted by the cheaper carbolic acid (q.v.), though not for internal medication.

CRE'ATINE, or KRE'ATINE (Gr. *kreas*, flesh), was discovered in 1835 by Chevreul, but little was known about it till Liebig published his *Researches on the Chemistry of Food*, in 1847. From his investigations, and those of subsequent chemists—amongst whom we may especially name the late Dr. William Gregory, of Edinburgh—the following facts regarding its properties and occurrence have been established.

C. forms transparent, glistening crystals, belonging to the clinorhombic system, and usually occurring in groups, the character of which is exactly similar to that of sugar of lead. Although usually grouped among the basic bodies, it is neutral in its reaction. It dissolves in 74.4 parts of cold water, and in boiling water in such quantity that the solution on cooling solidifies into a mass of delicate needles. These crystals contain two atoms of water and one atom of anhydrous C., whose composition, according to Liebig, is represented by the formula $C_4H_7N_3O$. There is no direct chemical test for the detection of C., and the methods which have been employed to obtain it are too complicated for insertion in this article.

C. is constantly present in the juice both of voluntary and involuntary muscles. The quantity differs in the flesh of different kinds of animals, and even in different muscles of the same animal, but is always very small; and lean animals yield relatively more than fat ones. According to Liebig, the flesh of hens yields the largest amount, viz., 0.32 per cent, the average quantity from horse or ox flesh being 0.07 per cent. Gregory determined its amount in the flesh of various mammals, birds, and fishes; and Schlossberger found 0.067 per cent in human flesh. It has likewise been detected in very small quantity in the blood of oxen, also in the liquor amnii of women who have died in advanced pregnancy, and it can usually be obtained from the urine, although it is doubtful whether it is a normal constituent of that fluid. It does not exist in the liver or kidneys, but has been found among the soluble constituents of the brain.

Although the view has been advocated that, from its occurrence in flesh, and from its large amount of nitrogen (32.06 per cent), it must be an important nutritive agent, there are most decisive reasons for opposing this opinion, and for ranking it among the products of excretion; for, in the first place, if it could be employed with further advantage in the organism, it (or its near ally, creatinine) would not be allowed to escape by the kidneys; secondly, the readiness with which it may be converted into unquestionable products of excretion (as, for instance, into urea, by the action of heat and baryta water), proves its approximation more nearly to these substances, than to such bodies as albumen or fibrin; and thirdly, there is no instance of a tissue-forming food occurring in a crystalline form.

CRE'ATININE is closely allied in its chemical and physiological relations to creatine. Liebig found that, when heated with a strong mineral acid, a solution of creatine no longer yields crystals of that substance, but a new body of totally different chemical properties, to which he gave the name of creatinine. Its chemical composition is represented by the formula $C_4H_5N_3O_2$, and on comparing this formula with that for creatine, we see that the conversion of the latter into the former, by the action of mineral acids, depends upon the separation of the elements of water. Liebig shortly afterwards detected C. as a constituent of the muscular juice. In the latter fluid, it occurs in less quantity than creatine; while in the urine, where it is also found, it is the more abundant of the two. Traces of it have also been found in the blood and in the liquor amnii.

C. crystallizes in oblique rhombic prisms, is a most decided alkaloid, reacting strongly on vegetable colors, and having almost as caustic a taste as ammonia; it further differs from creatine in its far greater solubility in water, alcohol, and ether There can be little doubt that C. takes its origin from creatine.

CREA'TIONISM, a term recently applied to that theory of the origin of man which is thought to be opposed to evolutionism (see ANTHROPOLOGY, EVOLUTION). C., however, has for centuries been used to indicate a theory as to the origin of the soul. The question in theology has been, whether the soul of each man is immediately created by God, or is generated by the parents as really as is the body. The former theory is called *creationism;* the latter, *traducianism*. The following arguments are advanced by traducianists: 1. The Scripture declaration that "Adam begat a son in his own likeness, after his image." Concerning this son, they affirm that, as he consisted of body and soul, these must both have been in the image and likeness of his father, and both must have been derived, mediately, from him. 2. The advocates of this theory affirm that it is necessary in order to account for the transmission of a sinful nature from Adam to his posterity. Community of essence, they say, produces community in sin. If mankind were not in Adam as to essence, they did not sin in him, and do not derive

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their corrupt nature from him; but if they were in him as to essence, then his sin was their sin. 3. Some urge also that the incarnation of Christ involves the truth of the traducian theory. He was born of a woman. Unless both his human soul and his body were derived, mediately, from his virgin mother, he cannot truly be of the same race with mankind. 4. Another argument is drawn from the transmission from one generation to another of ethnical, national, family, and parental peculiarities of mind, temper, and disposition, as well as of physical constitution. On the other hand, in behalf of C —the theory that every human soul is created by the immediate agency of God—the following arguments are maintained: 1. That it is in accordance with the general teaching of Scripture. In the account of the creation of man, there is, they say, a marked distinction between the origin of the body and of the soul. The one is, mediately, from the earth; the other, immediately, from God; and this distinction is continued through the Bible. The body and soul are not only represented as different substances, but also as having a different origin: "The dust shall return to the earth as it was, and the spirit shall return unto God who gave it." God is called "the God of the spirits of all flesh," and "the Father of spirits." 2. C., it is said, is more consistent with the nature of the soul which, being immaterial and spiritual, must be indivisible. The traducian theory, on the contrary, implies that the essence of the soul is capable of division. Some of its advocates, indeed, deny that there is any division; but the great majority of them admit that the derivation of one soul from another requires a division of essence. 3. The advocates of C. think they have an argument for it in the very teaching of Scripture concerning the person of Christ to which their opponents resort. He assumed our nature by taking to himself a true body and a rational soul. He was born of a woman; in his human nature, he was the son of David, and was descended from the fathers. As such, the advocates of both theories admit, he was without sin. But if, as traducianism affirms, mankind derive a sinful nature from Adam because of their community of essence with him, then C. replies that the human nature of Christ, sharing the same community of essence, must also have shared in the sinfulness. While these two theories are generally arrayed in opposition, as if one or the other must be true, it is conceivable that there is a truth in both. Many theologians do not affirm either; but, regarding the mode of the soul's coming into being as a part of the mystery which envelops the whole subject of the existence, maintenance, and transmission of life, are content to say with Augustine, "When I wrote my former book I did not know how the soul derives its being, and I do not know now." See TRADUCIANISM.

CRÉBILLON, CLAUDE PROSPER JOLYOT DE, the younger, son of the dramatist, 1707–77; b. in Paris. In an age of licentious manners, he acquired popularity by a series of romances, remarkable chiefly for their violation of decency, the principal of which are *Le Sopha; Le Hasard du Coin du Feu; Les Egarements du Cœur et de l'Esprit.* His own moral character is described as correct.

CRÉBILLON, PROSPER JOLYOT DE, a French dramatist, was b. at Dijon, in 1674. He was sent to Paris to study law, but ended by devoting himself wholly to poetical pursuits. His first piece, *La Mort des Enfants de Brutus*, was rejected by the actors; but the succeeding dramas of *Idoménée* (1705) and *Atrée* (1707) were successful. *Rhadamiste* (1711), a tragedy of the dismal kind, was reckoned C.'s masterpiece, and established his reputation. After producing some other pieces, C. fell into pecuniary difficulties and neglect, and for more than twenty years produced nothing. His talents were then called again into requisition by Mme. de Pompadour, who wished to humble Voltaire. He received from the king a pension of 1000 francs, and completed the tragedy of *Catilina*, for which the king himself supplied all the properties. When 81 years old, C. wrote his tragedy, *The Triumvirate*, and, still later, commenced but did not finish, another called *Cleomède.* He died June 17, 1762, and Louis XV. erected a monument to his memory. C., in general, displays little skill in the conduct of his plots; the monologues of the speakers are too numerous and too long; but in the opinion of his countrymen he is surpassed, in the "grandeur of his sentiments," only by the author of the *Cid* and *Horace.* The best edition of C.'s works is that published by Didot (2 vols., Paris, 1818).

CRÈCHE (French, *crèche*, "a crib"), a public nursery where children can be left by their mothers, and cared for while the mothers are at work. The children are fed, provided for, and instructed according to their capacity, for a merely nominal fee.

CRÉCY, or CRESSY, a small t. of France, in the department of Somme, situated on the Maye, about 12 m. n. of Abbeville. C. is chiefly celebrated on account of the brilliant victory obtained here, 26th Aug., 1346, by Edward III., with 40,000 English soldiers, over a French army amounting, according to Froissart, to 100,000 men, under the command of the count of Alençon. In this great battle, one of the most honorable to English prowess recorded in history, the flower of French chivalry was slain, as well as the kings of Bohemia and Majorca, who were fighting on the side of France. Altogether, about 30,000 of the French army bit the dust. In this battle the black prince, who greatly distinguished himself, gained his spurs; and the crest of the slain Bohemian king, composed of three ostrich feathers, with the motto, *Ich Dien*, "I serve," was adopted by him in memory of the victory, and still continues to be borne by the prince of Wales.

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CREDENCE, a small table beside the altar or communion-table, on which the bread and wine are laid before being consecrated. In the Greek church this is called the *trapeza prothesis*. Archbishop Laud was a great stickler for the C., and pleaded the authority of bishop Andrews and other bishops for its use. There are credences in various Anglican churches; among others, in the Collegiate and St. John's churches, Manchester; and in the parish church at Ludlow, where they have been in use from time immemorial. Sometimes the place of the C. was supplied by a mere shelf across the fenestella. The Oxford movement counts among its results the re-establishment of the credence in the majority of parishes both in the Church of England and in the Episcopal church of the United States. The term was also used for a buffet, or sideboard, at which the meats were tasted in early times before being presented to the guests, as a precaution against poison. Hence the origin of the word, which is derived from the Ital. *credenzare*, to taste meats and drinks before they were offered to another, an ancient court practice, which was performed by the cup-bearers and carvers, who for this reason were called in Ger. *credenzer*. See illus., FURNITURE, vol. VI.

CREDENTIALS, papers or letters given to an ambassador or other public minister, to a foreign court, in order to enable him to claim the confidence of the court to which he is sent.

CREDIT, in political economy, is one of many terms used in that science, of which it is said that we yet possess no scientific definition. This is the less to be regretted, as the practical meaning of the word is thoroughly known, so as to enable every one to understand what is meant, when economists speak of the extent to which C. is safe or proper, unsafe or improper, in this or that class of cases. We have come, perhaps, thus far towards an exact scientific notion of the nature of C., that while it serves the purpose of capital, it can only do so while there is capital ready to come and take its place if necessary. Credits which are not in this position—though they may happen to serve their turn, as a ship may sail some distance unwrecked without a steersman—do not accomplish the purpose of capital. The real power of C., properly resting on capital, is that it enables that capital to be devoted to more than one purpose. A bank is a great emporium of C.; that is to say, it consists of a certain amount of capital, which can be operated on by a whole community—not all at one time, but by individuals as occasion requires. Thus, a comparatively small stock of money can be made to do duty for carrying on numerous transactions. But it is indispensable for insuring a safe system of C. that money must be instantly available when wanted; and this principle applies not alone to banking, but to every species of transaction in which postponed payment is concerned. Unfortunately, this principle is too often set aside, and C. is grossly abused. The facts brought out in great bankruptcies generally teach the moral, that men who have every element of human well-being in their power, ruin themselves both in purse and fortune, by trying to make $30,000 do the work of $100,000. In many bankruptcies, too, there is a curious illustration of the power of C. as a representative of capital, in enabling men to keep up for a considerable time the appearance of being wealthy traders, though they never had a farthing they could honestly call their own. In the few instances where such projects succeed, there is the kind of applause which is given to the successful winner in any game of chance; and it is naturally felt that if the successful are applauded, it is hard to condemn the unsuccessful; so that there is perhaps a dangerous leniency in public opinion towards speculators on credit.

In a modified shape, C. is a thing which, to all apppearance, can never be abolished. There is scarcely a human being in a civilized country, who does not transact a piece of credit business almost every day of his life. The workman hired by the week, and paid at its end, gives his employer C. from Monday morning to Saturday evening. The same workman, when getting a coat made for himself, even although he engaged to pay ready money on delivery, gets C. from the tailor during the making. It is necessary to consider these things, because a course of C. is often so hurtful to people of the working-classes, by fastening ruinous obligations on them, that some people have proposed to abolish all C. where they are concerned, by rendering them free from all legal procedure for the recovery of debts. The answer to this is, that although it is practicable to relieve any class from obligations, and their legal enforcement, it is impossible in a trading country to suppress debt and credit. It is practicable, however, so far to modify the legal remedies against debtors of the poorer class, that there may not be, as there too often is, a temptation to traders to transact a special business, in holding out temptations to working-people to purchase on credit.

CREDIT, CASH. See CASH ACCOUNT.

CREDIT, LETTER OF. This is the term applied to accounts, usually in the form of a *letter*, addressed by one party to another, whereby the former requests the latter to pay a sum therein specified to the bearer of the letter, or some other third party named in it, and authorizes him to reimburse himself for such payment, either by debiting it in account between the parties, or by drawing on the first party for the amount. This arrangement may take place between merchants or others, but in general it occurs between *bankers* residing in different places—as, for example, between a banker in New York and his correspondent in London; and it is designed for enabling a party who has money lodged at either place, to obtain the use of it at the other, without the risk

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or trouble of actually carrying it between the two cities. For this convenience, a small charge is made by the bank issuing the letter, termed the exchange or commission. Sometimes the letter is addressed to *all* or *several* of the correspondents of the bank issuing it, in which case it is termed a *circular credit;* and any of them may pay the sum mentioned, or sums to account as desired, taking the holder's receipt, or his draft on the granter, in exchange; and the sums so paid are *indorsed* on the letter, to show how far the credit has been used. If the party holding a circular letter can be properly introduced, even at a place where the granter has no correspondent, little difficulty will be experienced in obtaining money upon it; and the practice is to reimburse any one who has given the money, if within the amount of the credit. It will thus appear that the system is productive of much convenience to all parties who have occasion to travel, or transact business away from home, especially in foreign countries, where it might be difficult otherwise to make their way, except by carrying with them an unsafe amount of coin or other valuables. See CHEQUE-BANK.

English bankers, having an extensive correspondence abroad, issue what are called *circular notes*, usually of the value of £10 or £20 each, which any of the granter's correspondents, or, indeed, any one else, may cash to the holder, on his "indorsement;" but a third party must take his risk of its being questioned. For this kind of credit, the receiver at once reimburses the granter; whereas for the ordinary letter of C., he is only reimbursed when the drafts under it are advised to him, the holder continuing during the interval to raise interest on his money deposited for covering it. The circular-note plan was devised about 1770 by Mr. Herries, the founder of the eminent London banking-house of Herries, Farquhar & Co., who had originally been a continental merchant, and well knew the difficulties which travelers or traders then had to encounter in foreign countries. Although the system is now highly appreciated, it cost him no little trouble and perseverance to establish it in public estimation. See CIRCULAR NOTES.

CRÉDIT FONCIER, a peculiar method of borrowing money in France on the security of landed property. It was established by an edict of 28th Feb., 1852. Its peculiarity is, that the repayment of the loan is by an annuity terminable at a certain date; the date and the amount of annuity being so calculated, that when the last payment is made, the loan and the interest on it will be extinguished. Another method of describing it is as a loan repayable by installments. The transaction is precisely regulated by the edict, which prohibits an advance on more than a half of the value of the property pledged or hypothecated. Three several companies were established by the French government, with the privilege of making such advances.

CREDIT MOBILIER. See MOBILIER.

CREDIT MOBILIER OF AMERICA, the name of an organization chartered in Pennsylvania in 1859, as a corporation for a general loan and contract business. It was organized in 1863 with a capital of $2,500,000; and in 1867, the charter having been purchased by a company formed for the construction of the Union Pacific railroad, the stock was increased to $3,750,000, and soon afterwards rose to great value, paying enormous dividends. It was charged in 1872, that a number of senators and members of congress were privately owners of the stock, and a congressional investigation was ordered, whose result showed that in some cases the charges were well founded. There was no law to prevent such ownership; but as the building of the railroad was greatly assisted by grants of land made by congress, it was considered at the least highly improper for any member to have a pecuniary interest in such a concern. The senate committee reported the innocence of several who had been accused, and recommended the expulsion of one senator; but no action was taken. In the house, resolutions censuring two members were adopted. It became evident, on the whole, that the charges, though not without some basis, had been applied so promiscuously as to involve some men absolutely free from offense.

CRED'ITON, or KIRK'TON, a borough in the middle of Devonshire, on the Creedy, a tributary of the Exe, 8 m. n.w. of Exeter. It lies in a narrow vale between two steep hills. Pop. '91, 4207. At C. was born the Anglo-Saxon Winfred, or St. Boniface.

CREDITOR. See DEBTOR; INSOLVENCY.

CREEDE, town and co. seat of Mineral co., Col.; on the Denver and Rio Grande railroad; about 32 miles n.w. of Del Norte and 320 miles s.w. of Denver. It is in a barrow gulch on Willow creek, among the mountains, 9,500 feet above sea level; was founded in 1890 by N. C. Creede, who staked the first mine there the previous year; was almost entirely destroyed by fire in 1892; and has a national bank, public schools, weekly newspaper, and many valuable mines, of which the Holy Moses, Amethyst, Last Chance, New York, and the United and Antler's Park groups are the best known. Pop. '96, about 2500.

CREEDMOOR, a village on the Long Island railroad, 11 m. e. of New York, where there is the largest and most complete rifle range in the United States. It is much frequented by riflemen for target practice.

CREEDS AND CONFESSIONS are the names given to the authorized expressions of the doctrine of the church at large, or of the several main sections into which it is divided. Such statements of doctrine sprang up naturally in the course of the church's progress. As the simple truths taught by Christ in an unreflective and mostly concrete form

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became the subjects of thought, of argument, of controversy, they could not fail to receive a more defined intellectual expression, and to be drawn out into more precise dogmatic statements. Men's minds could not be exercised on subjects of such vast importance to them without this result; and the great creeds, as they rise in succession before us, and mark the climax of successive controversial epochs in the church, are nothing else than the varying expressions of the *Christian consciousness and reason*, in their efforts more completely to realize, comprehend, and express the originally simple elements of truth as they are recorded in Scripture. The study of the creeds would be nothing else than the study of theology in its highest historical development—in its reflex settlements after the great agitations of Christian thought had run their course.

Corresponding to this view, we find that the creeds of Christendom grow in complexity, in elaborate analysis and inventiveness of doctrinal statement, as they succeed one another. The first are comparatively brief and simple in sense and form; the last are prolix and largely didactic. From the apostles' creed to the decrees of the council of Trent, or the chapters of the Westminster confession of faith, there is a wide change, during which the Christian consciousness has grown from a childlike faith to a critical opinionativeness.

What has been called the *apostles' creed* is the earliest form of Christian creed that exists, unless we give the precedence to the baptismal formula at the close of St. Matthew's gospel, out of which many suppose the apostles' creed to have grown. There were in the early church differing forms of this primitive creed: that which is received and repeated in the service of the church of England, has come to us through the Latin church; and in several of its clauses, as, for instance, "He descended into hell," and again, "The communion of saints," is supposed to have been interpolated according to later notions. A great variety of opinions has been held as to the origin of this creed. The Roman Catholic church has not only attributed it to the apostles directly, but professes to settle, on the authority of a spurious sermon of St. Augustine, the clauses respectively contributed by the several apostles: "Petrus dixit, Credo in Deum Patrem omnipotentem. Joannes dixit, Creatorem cœli et terræ. Jacobus dixit," etc. The earliest account of its origin we have from Rufinus, a historical compiler and traditionalist of the 4th century. His statement is, that the apostles, when about to separate to preach the truth to different nations, agreed upon a "form of sound words" which should express the sum of their common teaching. "When met together, and filled with the Holy Ghost, they composed this compend of what they were to preach, each one contributing his share to the one composition, which they resolved to give as a rule of faith to those who should believe." No great weight belongs to this testimony; Rufinus is no historical authority. It is not improbable in itself, however, that even in the age of the apostles some formula of belief existed. The exact form of the present creed cannot pretend to be so ancient by 400 years, but a form not much different from it was in use long before. Irenæus, the scholar of Polycarp, the disciple of St. John, when he repeats a creed not much unlike to the present, assures us that "the church dispersed throughout the whole world had received this faith from the apostles and their disciples;" and Tertullian also affirms that a similar creed had been "prevalent as a rule of faith in the church from the beginning of the gospel." The same thing is proved by the creeds administered to the candidates for baptism in the 2d and 3d centuries. They correspond, with slight variations, to the apostles' creed. The true view of this formula of church belief, therefore, seems to be that which regards it as the Roman or Latin form of the creed which prevailed in all the early churches. It is not strictly apostolic —certainly not in the order of words derived through the Latin church, in which it is now received and repeated; but it is substantially apostolic—fairly representative of the different elements of Christian faith as handed down from the apostles, and well claiming, therefore, the credence of the universal Christian church. Since the reformation in England, it has been the usage to exhibit the apostles' creed and Ten Commandments in legible characters on boards near the communion-table in churches, in order that they might be seen and repeated by the common people, who were unprovided with books.

The *Nicene*, or rather the Niceno-Constantinopolitan creed, is the next great expression of doctrinal truth that we meet in the history of the church. It sprang out of the conflict, which had begun even in the 2d c., as to the dignity and character of Christ. From the beginning, Ebionitism had looked upon Christ as merely a Jewish teacher of distinction; Theodotus and Artemon openly taught such a doctrine in Rome towards the close of the 2d century. Others, on the contrary, taught a doctrine which identified Christ with God absolutely in such a manner as to destroy all distinction of persons in the Godhead. Monarchianism, as it was called, which held rigorously and formally to the unity of God, was the ruling principle of both doctrines, opposite as were the expressions it assumed in the two cases.

The controversy thus begun in the 2d, perpetuated itself in the 3d c., under various modifications. Paul of Samosata carried out the Unitarian tendency, which reduced Christ to the level of a mere man; Sabellius carried out the same tendency in the opposite direction, which made Christ not merely divine, of the same substance with the Father, but looked upon him as merely a manifestation of the Father, without any dis-

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tinct personality. Sabellianism recognized a Trinity of manifestations, but not a Trinity of essences. God was one and all-comprehending, and the Son and the Spirit were merely names or expressions for the different modes in which he reveals himself. Sabellius flourished about the middle of the 3d c., and Paul of Samosata somewhat later. Arius, who was a presbyter of Alexandria, grew up in the midst of these heretical influences, and soon distinguished himself in the Alexandrian church for his advocacy of the doctrine that Christ, although in a true sense divine, or the Son of God, was yet not the very God. He denied that he was "of the substance of God," or "without beginning;" he was only the highest of created beings, in a sense divine, but not the same in substance with the Father, nor equal with him in power and glory. Athanasius came forward as the opponent of Arius, and the contest between them raged keen and wide throughout the church.

The council of Nicæa was summoned in 325 by Constantine, with the view of settling this controversy; and the Nicene creed was the result. There were these three parties in the council—the Athanasians, or extreme orthodox party; the Eusebians, or middle party; and the Arians, or heretical party. The heretics were few in number, and possessed but little influence; but the Eusebians were a strong party, and for sometime resisted certain expressions of the orthodox or Athanasians, which seemed to them extreme and unwarranted; but at length the Homöousians, as they were called, carried the day; and Christ was declared not merely to be of like substance (*homoiousios*), but of the same substance (*homöousios*) with the Father. At the later council of Constantinople, the additional tenet of the divinity of the Spirit was added, and the creed completed in the form in which it is familiar to the English reader in the communion service in the book of common prayer. In it we confess, as has been said, to the holy and undivided Trinity, and distinctly own the divinity of each person. We commemorate the creation of the world by "God the Father Almighty;" we acknowledge Jesus Christ to be our "Lord;" to have been "begotten" from all eternity; to be "of one substance with the Father," and with him Creator of all things; that "for our salvation he came down from heaven, was made man, and suffered and died for us." We commemorate his resurrection, ascension, and sitting at God's right hand; express our expectation of his second coming; and declare that "his kingdom shall have no end." We confess to God that he hath appointed baptism for the remission of sins, and given us leave "to look for the resurrection of the dead" and "the life of the world to come." See FILIOQUE.

The next remarkable monument of doctrinal truth in the church is what is called the *Athanasian creed*, a product of the 5th c., much later than Athanasius himself, but representing, with great formal minuteness and fidelity, his doctrine of the Trinity, as apprehended and elaborated by the western church. See ATHANASIAN CREED.

The Apostles', the Nicene, the Athanasian, may be said to form the great Catholic creeds of the church. After the time of the last-mentioned formula, there is no general symbol of faith that claims our attention till the period of the reformation. Theology continued to be cultivated during the middle ages, and especially during the 12th and 13th centuries, with great assiduity. Scholasticism is nothing else than the vast expression of the intellectual labor bestowed upon this subject during these ages, when scarcely any other subject can be said to have engaged men's minds. It was characteristic of scholasticism, however, to work mainly upon the doctrinal *data* already adopted and authorized by the church, developing these data in endless sentences and commentaries. There was, withal, no real freedom of inquiry, nor life of speculation. But as soon as the eye of free criticism and argument was turned upon Scripture with the reformation, new creeds and confessions began to spring up. On the one hand, Protestantism had to defend its position and its scriptural authority by appeal to its system of belief; and, on the other hand, the church of Rome, after many delays, gave forth at the council of Trent (1545 to 1563), a more extended and detailed statement of its doctrine than was to be found in any previous creed. The *decrees of Trent* are the fixed authoritative symbol or confession of faith of the church of Rome.

Of the Protestant churches, the most notable confessions of faith are the Lutheran; the continental Calvinistic or Reformed; the Anglican, or 39 articles of the church of England; and the Puritan, or Westminister confession of faith.

The Lutherans call their standard books of faith and discipline, *Libri Symbolici Ecclesiæ Evangelicæ;* and reckon among them, besides the three catholic creeds, the Augsburg confession (q.v.), the Apology for that confession by Melancthon, the articles of Smalkald drawn up by Luther, Luther's catechisms; and in some churches, the formula of Concord, or the book of Torgau.

Of the continental Calvinistic or Reformed churches, there are numerous confessions. the principal of which are—1. The Helvetic confessions—that of Basel, 1530, and Bullinger, *Expositio Simplex*, 1566; 2. The Tetrapolitan confession, 1531; 3. The Gallic confession, 1559; 4. The Palatine or Heidelberg confession, 1575; 5. The Belgic confession, 1559.

The *thirty-nine articles* of the church of England have been already described. See ARTICLES, THE THIRTY-NINE. They were originally 42, and are supposed to have been chiefly composed by Cranmer. In 1571, they were revised and approved by convocation and parliament.

The Westminster *Confession of Faith* was the product of the great Puritan agitation

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of the 17th century. As soon as the Long Parliament assembled in 1640, it set itself to consider the question of the reformation of religion. It carried resolution after resolution directed against the existing government of the church of England; and at length, on the 23d of Nov., 1641, it passed the famous remonstrance, in which it proposed that, "in order the better to effect the reformation in the church, there should be a general synod of grave, pious, learned, and judicious divines, who should consider all things necessary for the peace and good government of the church." Out of this proposal sprang the Westminster assembly, although the parliamentary ordinance actually summoning the assembly was not issued until a year and a half later—viz., June 12, 1643. According to this ordinance, the assembly was to consist of 121 clergymen, assisted by 10 lords and 20 commoners as lay assessors. Many of these appointed members, however, never took their seat in the assembly. The bishops were prevented from doing so by a counter ordinance of the king.

Among the most notable divines who did assemble were Burgess, Calamy, Gataker, and Reynolds, and Gillespie, Henderson, Baillie, and Samuel Rutherford, the commissioners from Scotland, of the Presbyterian party; Goodwin, Nye, and Burroughs, of the independent party; and Lightfoot and Coleman, with Selden, of the Erastians. The Presbyterians greatly predominated, and the acts of the assembly bear throughout the stamp of Calvinistic Presbyterianism. It began its sittings in the autumn of 1643, and sat till the 22d Feb., 1649, having lasted upwards of five years and a half. During this period it had, met 1163 times.

The most important labors which it achieved were the directory of public worship and the confession of faith. This latter document was completed in the third year of its existence (1646), and laid before parliament in the same year. It was approved by the general assembly of the church of Scotland in 1647, and again in 1690, on the renewed establishment of Presbyterianism after the revolution.

The confession of faith, as it is the latest of the great Protestant creeds, so it is one of the most elaborate of them all. It extends to 33 chapters, beginning with *Holy Scripture*, and ending with *The Last Judgment*. Of its 33 chapters, 21 may be said to be distinctly doctrinal — the first 19 and the last 2. The others concern such subjects as *Christian Liberty, Religious Worship, Oaths and Vows*, the *Civil Magistrate*, the *Church*, the *Sacraments, Synods and Councils*. The tone of the doctrinal chapters is that of the later and formal Calvinism which spread from Holland among the English Puritans. The ecclesiastical spirit is Puritan-Presbyterian. "God alone" is declared to be "Lord of the conscience;" yet the "publishing of opinions contrary to the light of nature, or to the known principles of Christianity," is at the same time declared to be matter of censure by the church, and of punishment by the civil magistrate. In composition, the confession is an able and comprehensive summary of theological truth, showing great logical skill in the deduction of particular doctrines from certain main principles. The third chapter, *Of God's Eternal Decree*, may be said to be the key-note from which its most characteristic doctrines follow in immediate sequence and harmony. It is well deserving the attention of all students of theology, not only as a remarkable monument of Christian learning, but as the most representative expression of a great spiritual movement which has deeply tinged the national thought of Britain, and modified the course of its history. It is issued, under authority, as a cheap duodecimo volume by printers in Edinburgh, for general use throughout Scotland. Incorporated in the volume is the text of the covenants, but these are not esteemed part of the confession. See COVENANTS.

CREEK, in geography, is a small inlet on a low coast, and in rivers formed by the mouths of small streams. In America, the term C. is applied to small inland rivers.

CREEKS, a nation of Indians originally living in Alabama and Georgia. During the revolutionary war they adhered to the English, and were hostile to the colonists even after peace. But in 1790, they made a treaty with the federal government, in which nearly a dozen other nations or tribes joined. They again supported the British in the war of 1812, and perpetrated a number of outrages, the most important of which was the massacre of 400 men, women, and children at Fort Mimms. Unsparing war was made upon them by Gen. Jackson and other leaders, and in Mar., 1814, they were completely crushed. They had lost 2000 warriors, and their country had been desolated. Still, there was trouble with them almost constantly until, in 1836 they were removed to the present Indian territory. The whole number removed was 24,594. They resisted all efforts of missionaries and teachers, and it was not until 1843 that the first school was established among them. In 1857 they numbered only 14,888. In the war of the secession, they were about equally divided. They defeated the confederates in two small engagements; but in a third they were routed, and more than 6000 men women, and children fled to Kansas. In 1890 their number was found to be 9291, and they had 84 schools. The governmental system of these Indians is peculiar. Each town is independent of all others, and is ruled by its own elective king, the next officer being the chief warrior. The number of chiefs became so oppressive that a change was made, and, in 1868, a plan was adopted to choose a first and second chief, a house of warriors and a house of kings. In 1869, the fugitives of the tribe were returned to their nation.

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CREEPER, *Certhia*, a genus of birds, the type of the family *certhiadæ;* having a longish, slender, arched, and pointed bill; a long, narrow, sharp-pointed tongue, jagged near its tip; the tail rather long, and the tips of the tail-feathers firm and pointed, extending beyond the webs. The feet are rather slender; the hinder toe about as long as the other toes. Of this conformation of feet and tail great use is made in climbing trees, the stiff feathers of the tail being employed for support. Although the family is large, it is doubtful if the genus contains more than one true species, the COMMON C. (*C. familiaris*), a bird found in all temperate parts of the northern hemisphere, wherever wood abounds.

CREEPS, a miner's term for the depression which takes place on the surface from the removal of beds of coal beneath. Masses of the coal-seam, like huge pillars, are left by the miners for the support of the superincumbent strata; the pressure, however, of these beds is so great that, in course of time, the ceiling gradually sinks, or, as is more frequently the case, because of the ceiling consisting of hard rock, the softer shale pavement rises, until the intervening spaces between the pillars, left by the removal of the coal, are filled up. A consequent depression takes place in the beds above, as also an alteration of the surface-level. But this being so gradual is seldom noticed, except when it is made evident from the accumulation of surface-water, or in districts where railways pass over the coal-fields.

CREESE OR **CREASE**, a Malay weapon, also known by the name KRIS (q.v.).

CRE'FELD. See KREFELD.

CREIGHTON, the Rt. Hon. and Rt. Rev. MANDELL, was b. at Carlisle in 1843; educated at Durham Grammar school and elected postmaster at Merton College, Oxford, in 1862, where he pursued his studies, receiving high honors in 1866. He was ordained priest in 1875, and entered upon the living of Embleton in Northumberland. He was elected in 1884 to the professorship of Ecclesiastical History in the University of Cambridge. Canon Creighton visited the United States in 1886, representing Emmanuel College at the centenary celebration of Harvard University. In 1896 he was appointed bishop of London. He became editor of the *English Historical Review* in 1886. His works are, *Primer of Roman History* (1875); *The Age of Elizabeth* (1876); *The Life of Simon de Montfort* (1877), *Primer of English History* (1877); *History of the Papacy during the Period of the Reformation* (1882), etc.

CRE'MA, a t. of northern Italy, province of Cremona, situated in a fine plain on the right bank of the Serio, 25 m. e.s.e. of Milan. C. is an ancient place, having been founded by the Longobards in the 6th century. It suffered much during the wars of the Guelphs and Ghibellines. C. is well built, is surrounded by a wall and ditch, has an old castle and cathedral and manufactures of silk and lace. Pop. 8000.

CREMATION, the burning of human corpses, appears to have been a general practice in early times, with three exceptions: Egypt, where they were embalmed; Judea, where they were laid away in sepulchers; and China, where they were buried in the earth. In Greece, suicides, children not yet having teeth, and persons struck by lightning, were denied the right to be buried. At Rome, burning was the rule down to the end of the 4th c. after Christ. Whether in any of these cases cremation was adopted or rejected for sanitary or religious reasons, it is difficult to say. Embalming would probably not succeed in climates less warm and dry than that of Egypt; the scarcity of fuel might also be a consideration. The Chinese are influenced by the doctrine of Feng-Shui, or incomprehensible wind water; they must have a properly placed grave in their own land, and with this view corpses are often sent home from California. Even the Jews used cremation in the vale of Tophet when a plague came; and the modern Jews of Berlin and the Spanish and Portuguese Jews at Mile-End cemetery have been among the first to welcome the lately revived process. Probably, also, some nations had religious objections to the pollution of the sacred principle of fire, and therefore practiced exposure, suspension, throwing into the sea, cave-burial, desiccation, or envelopment. Some at least of these methods must obviously have been suggested simply by the readiest means at hand. Cremation is still practiced over a great part of Asia and America, but not always in the same form. Thus, the ashes may be stored in urns, or buried in the earth, or thrown to the wind, or (as among the Digger Indians) smeared with gum on the heads of the mourners. In one case the three processes of embalming, burning, and burying are employed; and in another, if a member of the tribe die at a great distance from home, some of his money and clothes are nevertheless burned by the family. As food, weapons, etc., are sometimes buried with the body, so they are sometimes burned with the body, the whole ashes being collected. The Siamese have a singular institution, according to which, before burning, the embalmed body lies in a temple for a period determined by the rank of the dead man—the king for six months, and so downwards. If the poor relations cannot afford fuel and other necessary preparations, they bury the body, but exhume it for burning when an opportunity occurs. There can be little doubt that the practice of cremation in modern Europe was at first stopped, and has since been prevented in great measure, by views which had become associated with the Christian doctrine of the resurrection of the body; partly also by the notion that the Christian's body was redeemed and purified. Science has shown that burning merely produces quickly what putrefaction takes a long time to accomplish; but the feeling of opposition still lingers among the clergy of more than one nation. Some clergymen, however, as Mr Haweis in his *Ashes to Ashes, a Cremation Prelude*, have been promi-

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nent in the reforming movement The objection was disposed of by lord Shaftesbury when he asked, ' What would in such a case become of the blessed martyrs?" The very general practice of burying bodies in the precincts of a church, in order that the dead might take benefit from the prayers of persons resorting to the church, and the religious ceremony which precedes both European burials and Asiatic cremations, have given the question a religious aspect. It is really a sanitary one. The disgusting results of pit-burial made cemeteries necessary. But the cemeteries are equally liable to overcrowding, and are often nearer to inhabited houses than the old church-yards. There is indeed a disposition to build villas near ornamental cemeteries It is possible to make a cemetery safe approximately, by selecting a soil which is dry, close, and porous, by careful drainage, and by rigid enforcement of the rules prescribing a certain depth (8 to 10 ft.) and a certain superficies (4 yards) for graves. But one has only to read such a work as *Baker's Laws Relating to Burial* to see how many dangers burial legislation has to contend with. A certain amount of irrespirable gas will escape into the air, or into sewage drains, and thus reach houses, or corrupt material will percolate so as to contaminate water which is afterwards used. The great Paris cemeteries inflict headache, diarrhea, and ulcerated sore throat on their immediate neighbors; and a great mass of similar well-authenticated facts may be brought against even recent cemeteries in various countries. A dense clay, the best soil for preventing the levitation of gas, is the worst for decomposition. The danger is strikingly illustrated in the careful planting of trees and shrubs to absorb the carbonic acid. Vault-burial in metallic coffins, even when saw-dust charcoal is used, is still more dangerous than ordinary burial. It must always be remembered that the cemetery system can only be temporary. The soil is gradually filled with bones; houses crowd around; the law itself (in England) permits the re-opening of graves at the expiry of 14 years. We shall not, indeed, as Browne says, "be knaved out of our graves to have our skulls made drinking bowls, and our bones turned into pipes." But on this ground of sentiment, cremation would certainly prevent any interruption of that "sweet sleep and calm rest" which the old prayer that the earth might lie lightly has associated with the grave. And in the meantime we should escape the horrors of putrefaction and of the "small cold worm that fretteth the enshrouded form." For a long time many distinguished physicians and chemists in Italy have warmly advocated the general adoption of cremation, and in 1874, a congress called to consider the matter at Milan resolved to petition the chambers of deputies for a clause in the new sanitary code, permitting cremation under the supervision of the syndics of the commune. In Switzerland, Dr. Vegmann Ercolani is the champion of the cause, and there are two associations for its support. So long ago as 1797, cremation was seriously discussed by the French assembly under the directory, and the events of the Franco-Prussian war have again brought the subject under the notice of the medical press and the sanitary authorities. The military experiments at Sedan, Chalons, and Metz, of burying large numbers of bodies with quicklime, or pitch and straw, were not successful, but very dangerous. The question was considered by the municipal council of Paris in connection with the new cemetery at Mery-sur-Oise; and the prefect of the Seine in 1874 sent to all the cremation societies in Europe a circular asking information. The municipality of Vienna has actually made cremation permissive. There is a propagandist society, called the "Urne," and the main difficulty for the poor seems to be the conveying the bodies five miles. To overcome this a pneumatic tube has been proposed. Dresden, Leipsic, and Berlin are the centers of the German movement. In Britain the subject has slumbered for two centuries, since in 1658 sir Thomas Browne published his quaint *Hydriotaphia, or Urn-burial*, which was mainly founded on the *De Funere Romanorum* of the learned Kirchmannus. In 1817, Dr. J. Jamison gave a sketch of the *Origin of Cremation*, and for many years prior to 1874 Dr. Lord, medical officer of health for Hempstead, continued to urge the practical necessity for the introduction of the system. It was sir Henry Thompson, however, who of late first brought the question prominently before the public, and started in 1874 the cremation society of London. Its object is to introduce through the agency of cemetery companies, and parochial and municipal authorities, and burial boards, some rapid process of disposing of the dead, "which cannot offend the living, and shall render the remains absolutely innocuous." Thompson's problem was—"Given a dead body, to resolve it into carbonic acid, water, and ammonia, rapidly, safely, and not unpleasantly." Relying on the evidence which suggested recent burial legislation, he pointed out that in the neighborhood of cemeteries there is a constantly increasing risk of contaminated air and water. The problem he solved by the Siemens process of cremation, which, when generally employed, would effect a great saving in the cost of funerals, and would also leave a quantity of bone earth equal in value to the bones imported into this country chiefly for manure. The British authorities in India have already had much practical experience of cremation. Poor Hindus often did not supply wood and oil enough for the total consumption of the body, and hence sir Cecil Beadon at Calcutta, and the sanitary commissioner at Madras, both found it necessary in the public interest to erect cinerators on the burning-ghat or ground, which might be used on payment of a fee. So also at Poonah, Col. Martin, struck with the high cost (above 12 rupees) of even a poor funeral, constructed in 1864 a pentagonal cinerator for the use of Brahmans and the other Hindu castes.

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Among the practical methods of cremation which have recently been attempted, we may mention, in the first place, the experiments of Dr. Polli at the Milan gas-works, and those of Prof. Brunetti, who exhibited an apparatus at the Vienna exhibition of 1873, and states his results in *La Cremazione de Cadaveri*, Padua, 1873. Polli obtained complete incineration or calcination of the bodies of dogs by the use of coal-gas mixed with atmospheric air, applied to a cylindrical retort of refracting clay, so as to consume the gaseous products of combustion. The process was complete in two hours, and the ashes weighed about 5 per cent of the weight before cremation. Brunetti used an oblong furnace of refracting brick with side-doors to regulate the draught, and a cast-iron dome above with movable shutters. The body was placed on a metallic plate suspended on wire. The gas generated escapes by the shutters, and in two hours carbonization is complete. The heat is then raised and concentrated, and at the end of four hours the operation is over; 180 lbs. of wood costing about $0.60 was burned. In the reverberating furnace used by sir Henry Thompson, a body, weighing 144 lbs. was reduced in 50 minutes to about 4 lbs. of lime-dust. The noxious gases, which were undoubtedly produced during the first five minutes of combustion, passed through a flue into a second furnace, and were entirely consumed. In the ordinary Siemens regenerative furnace (which has been adapted by Recalm in Germany for cremation, and also by sir Henry Thompson) only the hot-blast is used, the body supplying hydrogen and carbon, or a stream of heated hydrocarbon mixed with heated air is sent from a gasometer supplied with coal, charcoal, peat, or wood, the brick or iron-cased chamber being thus heated to a high degree before cremation begins. In one arrangement both gas and air are at a white heat before they meet and burst into flame in the furnace. The advantage of the Siemens furnace and gas producer (which would cost about $4,000 in construction) are that the heat of the expended fuel is nearly all retained by the regenerators, and that the gas retort admits of the production being stopped without much loss. Some difficulty has been felt about keeping the ashes free from foreign material. The Greeks used a shroud of asbestos, the Egyptians one of amianth. Mr. Eassie suggests a zinc coffin—that metal being volatile. It is also suggested that the ashes might be deposited in urns, and these placed in a columbarium, which might be in the church or at home.

There are now more than 20 cremation societies in Italy, with crematories at Brescia, Padua, Varese, Rome, Cremona, Milan, and Lodi. Germany has many societies, and a large furnace at Gotha. In France, Switzerland, Austria, and Holland, the practice is regarded with favor. The Japanese have, in many places, adopted cremation, and are said to have reduced the actual cost to $1. The first crematory in America was erected by the late F. Julius Le Moyne, M.D., at Washington, Penn. There are furnaces at Lancaster, Penn., and Buffalo, N. Y. One society, incorporated 1881, has erected a crematory at Fresh Pond, L. I. There were 264 bodies cremated in 1895. Societies having similar purposes exist in nearly every large city in the U. S.; and there has been practically no opposition from scientific circles. It is estimated that the actual cost of incinerating a dead body amounts to $7; and the total charges, including all incidentals, need not exceed $45. The arguments in favor of C. are well put forth in *Cremation and other Modes of Sepulture*, by R. E. Williams, 1884. There is an abundant literature on this subject in the medical journals of this and other countries.

CRÉMIEUX, Isaac Adolphe, 1796–1880; b. at Nîmes, France, of Jewish parents. He studied law, and was admitted to the bar in 1817. About 1830, he went to Paris, where he soon became famous as an advocate, particularly in the defense in political prosecutions. He entered political life in 1842 as a deputy from Chinon, and served till 1848. He sat on the left, and in opposition to the reigning dynasty. Under the republic of 1848, he was elected as a deputy to the constituent and legislative assembly, acting and voting always with the left.

On the night of the 2d of Dec., when Napoleon throttled the republic, Crémieux was arrested and thrown into the prison of Mazas. During nearly the whole reign of Napoleon he remained in private life, devoting himself to his profession. In Nov., 1869, he was elected a deputy to the corps legislatif, where he took his seat on the extreme left, voting always with Gambetta, who was for a time a clerk in his law-office. His name is connected with many acts of legislation and many decrees. It was he who rendered the famous decree which chased from their seats the infamous magistrates composing the "mixed commissions" under the empire, whose infamous judgments drove from France into exile so many of her most distinguished and most gifted sons. Another decree justly bears his name, the "Decree Crémieux," which naturalized in mass 30,000 of his coreligionists in Algeria. The French nation will never forget his private subscription of 100,000 francs for the liberation of the French territory. He was a man of the highest sense of honor. Deutz, a Jew, who had surrendered up the duchess de Berri at Bordeaux, finding his treason overwhelmed by universal reprobation, asked from Crémieux what was called a "memoire justificatif." The advocate addressed him a letter in reply, which created much sensation at the time. He said: "I can do nothing for you. It is impossible for me to justify you in the eyes of the public. France is deaf to the justification of cowardice. It is necessary to submit to shame when one has com-

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mitted a treason. I can see nothing that will excuse a crime which I detest, and which arraigns you before no other judges than public opinion. If you count me as your coreligionaire you will see your error." A member of the provisional government of 1848, he was one of the first seven named by the chamber, and proclaimed to the people from the Hotel de Ville. They were Marie, Lamartine, Ledru-Rollin, Crémieux, Dupont de l'Eure, Arago, and Garnier Pagès. With the death of Crémieux, no one of that number now survives.

CREMO'NA, an important city of northern Italy, situated on the n. bank of the Po, which is here crossed by a bridge, about 48 m. s.e. of Milan. It is surrounded by walls with flanking towers and wet ditches, its circumference being nearly 5 miles. A canal uniting the Oglio and the Po passes through the city; and the latter river is navigable for large boats from this point to the sea. The streets of C. are wide and regular, and it has some fine buildings—the principal of which are the cathedral, built at different times, exhibiting various styles of architecture; the churches of San Margherita, Sant' Agostino, Santa Agata, and San Giorgio; the palazzo publico, campo santo, and the torazzo or belfry—one of the loftiest and finest towers in Italy, being 396 ft. high, and commanding magnificent views over the fertile plains of Milan. By means of the Po, C. carries on a considerable trade in the produce of the district; and it has manufactures of silk, cotton, earthenware, and chemicals. It was formerly greatly celebrated for its manufacture of violins, the Amati family, Stradivarius and other makers having won their reputation here. Its musical strings were also in great repute. Population, '91, 37,600. C. is the capital of a province of the same name, which has an extent of about 695 sq. m., and a population in '95 of 306,883.

CRENELLE, sometimes used for a battlement, but more frequently for the embrasures in a battlement. The adjective *crenellated* is in frequent use to signify that a building is supplied with crenelles. See BATTLEMENT.

CRE'NIC ACID is one of the constituents of vegetable mold, and is produced wherever leaves and other plant matter are decaying, especially in peat-bogs and marshes.

CRENSHAW, a co. in s.e. Alabama, drained by Conecuh river, formed in 1865 from portions of several adjoining counties; 660 sq. miles; pop. '90, 15,425, includ. colored. The surface is level and mostly covered with pine forests. Corn, cotton, and rice are the chief productions. Co. seat, Luverne.

CREOLE (Span., *criollo*) is a word used in speaking of the inhabitants of southern America, the West Indies, and Mauritius. In wider sense, it designates any individual born in the country, but of a race not native to it. Thus, a negro born in the country is sometimes called a C., in opposition to one imported. It is usually applied, however, to persons born in the colony or country and of pure European blood, as distinguished from immigrant Europeans, and also from the offspring of mixed blood, such as mulattoes and mestizoes. Brazilian creoles call themselves also Brasileiros.

CREOLE STATE. See STATES, POPULAR NAMES OF.

CREON, a fabulous king of Thebes, succeeding on the death of Laius, the husband of his daughter Jocasta. Thebes was then trembling before the cruelty of the Sphinx, and Creon offered his crown and his daughter to whomsoever would solve the enigma proposed by the monster. Œdipus, the son of Laius and Jocasta, ignorant of his parent age, having solved the riddle, received the reward, and thus became the husband of his own mother, by whom he had two sons, Eteocles and Polynices, who, after their father's death, mutually agreed to reign in alternate years. Eteocles began, but when his year ended he refused to resign, and war followed, which was decided by the brothers in single combat, when both were killed. Creon resumed the government during the minority of Leodamus, the son of Eteocles, and commanded that the Argives, and above all Polynices, the cause of all the bloodshed, should not receive the rights of sepulture, and that any one who infringed this decree should be burned alive. Antigone, the sister of Polynices, refused to obey, and sprinkled dust upon her brother's corpse. The threatened penalty was inflicted; but Creon's crime did not escape punishment. His son, the lover of Antigone, killed himself on his grave, and Thebes was attacked by Theseus, by whose hand Creon fell.

CREOSOTE. See CREASOTE.

CRESCENDO, in music, means a gradual increasing of sound, or changing from piano to forte and fortissimo. It is marked thus  , or with the abbreviation *cresc.* The swell of an organ, when well constructed, produces a most perfect crescendo.

CRESCENT. A representation of the half-moon with the horns turned upwards, called a C, is often used as an emblem of progress and success. It is generally spoken of as "the arms" of the Turkish empire; but is more properly the emblem of the empire and people—not a very appropriate one in our day. It was, however, the emblem of the Greek before it became that of the Turkish rule; and at the present day, is frequently to be seen on churches in Moscow and elsewhere in Russia, generally surmounted with the cross, marking unquestionably the Byzantine origin of the Russian church.

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CRESCENT, TURKISH ORDER OF. In 1799, after the battle of Aboukir, the sultan Selim III. testified his gratitude to Nelson by sending him a C. richly adorned with diamonds. It was not intended as an order, but Nelson wore it on his coat, and on several occasions called himself the knight of the C. Selim was flattered by the value which the English admiral, already decorated with so many orders, seemed to attach to his gift; and it was this circumstance which determined him, in 1801, to found the order of the crescent. Mohammedans being forbidden, in the Koran, to carry such marks of distinction, the order is conferred only on Christians who have done service to the state. The second person on whom it was conferred was gen. Sebastiani, for his defense of Constantinople against the English fleet in 1807. The insurrection of the Janissaries suspended the efforts at Europeanizing which Selim had begun, and when they were resumed by Mahmud, he instituted several other decorations. See MEDJIDIE, ORDER OF. There was an old order of the C. instituted at Angiers by René, duke of Anjou, brother and heir of Louis III., king of Naples, in 1464. Its objects were those common to the religious military orders of those days, the honor of God, the defense of the church, the encouragement of noble actions, and the glory of the founder. The dukes of Anjou and kings of Sicily were sovereigns of the order. The badge was a C. of gold, on which was the word Loz, enameled in red letters, the import being Loz (laus) en Croissant—Praise by Increasing. Like many other orders founded by the smaller sovereigns, the order of the C. did not survive the founder.

CRESCENT, in heraldry, is used both as a bearing or charge, and as a difference, or mark of cadency. In the latter case, it designates the second son, and those that descend from him. See CADENCY.

CRESCENTIA. See CALABASH TREE.

CRESCENTINO, a t. of n. Italy, in the province of Novara, about 22 m. n.e. of Turin. It is situated in a marshy district, near the confluence of the Dora Baltea with the Po. From its plan, it would appear to have been an old Roman station. It has manufactures of silk and woolens. Pop. about 7000.

CRESCENTIUS, a Roman popular leader of the 10th century, who gained the title of consul in 980 A.D. He professed intention of bringing back the ancient glory of republican Rome and tried to overthrow Pope Gregory V., who had been placed on the papal throne by the emperor Otto III. Otto defeated him, entered Rome and put him to death in 998.

CRESCENZI, PIETRO DE, about 1230–1307; an Italian writer, author of *Opus Ruralium Commodorum*, a work on agriculture, said to have been one of the first printed books. It was published in 1471.

CRESS, a name given to many plants, of which the foliage has a pungent, mustard-like taste, and is used as a salad. It is sometimes more strictly confined to the genus *lepidium*, a genus of the natural order *cruciferæ*, having small white flowers, and oblong or rounded laterally compressed pouches (silicules), with the cells one-seeded, and the valves keeled or winged on the back. The COMMON C., or GARDEN C. (*L. sativum*), is an annual, a native of the east, frequently cultivated in our gardens, and used in a young state as a salad; being easily procured in a few weeks from the time of sowing, and, by the aid of a little artificial heat, even in winter. There is an esteemed variety with curled leaves. Like most of the other plants of similar pungent taste, particularly those of the order *cruciferæ*, the garden C. is powerfully anti-scorbutic. Still more pungent, and almost like pepper in taste, is its congener, PEPPERWORT, *aittander*, or *poor man's pepper* (*L. latifolium*), found in wet places near the sea in some parts of Britain, and occasionally used as a condiment by the poorer classes. It was once in high repute as a remedy for various diseases. VIRGINIAN C. (*L. Virginicum*) resembles the garden C. in its properties, and is eaten as a salad, and used as a diaphoretic medicine in North America and the West Indies. *L. piscidium*, a native of the South Sea islands, is there used to stupefy fish; it is also one of the plants used by sailors for prevention or cure of scurvy. The name WINTER C. is given to species of the genus *Barbarea*, also cruciferous biennial or perennial plants, with racemes of yellow flowers, quadrangular pods, and lyrate or pinnate leaves. The common winter C. (*B. vulgaris*), formerly known as herb St. Barbara, is plentiful in moist pastures and hedge-banks in Britain, and throughout Europe and North America. It is occasionally cultivated as a winter salad; in Sweden it is used as a boiled vegetable. Its pungency is combined with some degree of bitterness. A double variety is common in flower-borders, and bears the name of YELLOW ROCKET. Very similar to this, and also occasionally cultivated, is the early winter C., or AMERICAN C. (*Barbarea præcox*), a native also of Britain, the continent of Europe, and North America. BITTER C. (*cardamine*) is another cruciferous genus, with linear pods, and flowers sometimes of considerable beauty, as in the common bitter C. or cuckoo-flower (*C. pratensis*), also known by the name of lady's smock—a very common ornament of moist meadows in Britain, with white, blush-colored, or light purple flowers; the flowers of which are stimulant and diaphoretic, and had at one time a high reputation for the cure of epilepsy, particularly

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in children, and still retain a place in the pharmacopœias. The young leaves of this species, as well as of *C. amara*, a species with still more beautiful flowers, and *C. hirsuta*, a small flowered species, both American, are used as salads, but more generally in some European countries than in America, being pungent with a little bitterness. The leaves of *C. amara* are brought to market in large quantities in Bohemia and Saxony. The juice of *C. pratensis* is much used as an anti-scorbutic in the n. of Europe, to counteract the effect of the constant use of salted meat and salted fish. WATER C. (*nasturtium officinale*) is a perennial aquatic cruciferous plant, much used both in England and on the continent of Europe as a spring salad. The genus *nasturtium*, which contains a considerable number of species, has a spreading calyx, and a nearly cylindrical pod. *N. officinale* is a native of almost all parts of the world. The leaves have a pungent bitterish taste, with a little saltness. They possess medicinal properties similar to those of SCURVY-GRASS. In favorable weather, they may be procured in winter as well as in spring, and may be frequently cut over during a season. The plant is cultivated to a considerable extent both in Germany and near London, in wide ditches, which are filled with slowly flowing and pure water. It grows best in clear shallow running water, with a bottom of sand or gravel. Mud is injurious both to its growth and to the flavor of its leaves. For INDIAN CRESS, see TROPÆOLUM.

CRESSET (Fr. *croisette*, diminutive of *croix*, cross), a name given to a great light on a beacon or watch-tower, to a lamp or torch, or a light fixed on a pole. The name owes its origin to the fact that formerly beacons were usually surmounted by a cross.

CRESSON, a health resort, Cambria co., Penn., on the Pennsylvania railroad, 102 m. e. of Pittsburg. It is on the top of one of the Alleghany mountains, 3,000 ft. above tide, and is a famous summer resort because of the purity of the air and the beauty of the scenery. There are mineral springs, and a fine hotel.

CRESSON, ELLIOTT, 1796–1854; a Quaker merchant of Philadelphia, who paid much attention to the Indian population of the country; also to the emancipation of the negroes from slavery, his method being mainly by colonization. He left over $120,000 to various benevolent institutions, besides an estate of more than $30,000 to found a home for aged or infirm merchants and gentlemen who had fallen into poverty.

CREST (Lat. *crista*, a tuft, from *cresco*, to grow up). Though popularly regarded as the most important feature in heraldic emblems, the C., in the eyes of heralds, is an external adjunct to the shield, without which the bearing is complete, and which may consequently be altered without materially affecting its significance. Occupying the highest place on the helmet, it is the member of the bearing by which the knight was commonly known in battle; and from this circumstance, it is to it that the term *cognizance* (from *cognosco*, to know) is properly given. Its claim to a classical origin is probably better than that of any other portion of coat armor. Jupiter Ammon is represented as having borne a ram's head on his helmet, and Mars the figure of a lion or a tiger. Alexander the great, on the pretense that he was sprung from Jupiter, assumed the ram's head; and Julius Cæsar bore a star, to denote that he was descended from Venus. The helmet, as we see it represented on ancient statues and gems, was frequently adorned with a crest. Sometimes it was of horse-hair; at other times a lion or other animal was placed on the helmet, either erect or couchant.

Newton, in his *Display of Heraldry*, says that the first C. to be met with in the monuments of English chivalry, is that on the great seal of Richard Cœur de Lion. The helmets in this instance, and in that of Roger de Quincy, earl of Winchester, differ in form from those afterwards used, the C. occupying a much larger space. Crests are said to have come into general use about the time of Henry III., and to have been used as marks of distinction by commanders in the holy wars, as they had formerly been by the Roman centurions For lightness they were often made of stuffed leather, which was gilt, silvered over, or painted—a circumstance which explains their greater size then than in later times, when they were made either of wood or metal. The earliest example of the wreath on which the C. is now invariably placed, is that on the monument of sir John Harsick. It consisted of two pieces of silk, of the colors of the armorial bearings of the wearer, twisted together by the lady who had chosen him for her knight. Though crests are now invariable appendages to shields, and many of them are appropriated to particular families by hereditary descent, they are believed to have been originally assumed at the pleasure of the wearers; and they are even now less strictly under the cognizance of the heralds than the devices on the shield, which must always be assigned by competent authority. Crests are so various that a classification of them is scarcely possible. The following is an abridgment of that given by Newton, who has written very fully on the subject in his *Display of Heraldry*. The most ancient class of crests he believes to have consisted of ferocious animals, which were regarded as figuratively representing the bearer and his pursuits. Secondly, they were devices assumed as memorials of feats of chivalry, and for the purpose of perpetuating traditions and family legends, either in addition to, or differing from, those represented on the shield. Thirdly, they served only to give a more prominent place to objects already represented on the shield. Fourthly, they commemorated religious vows, or expressed the religious or knightly aspirations of the bearer. Fifthly, they were mere whims, and were adopted for no very definite reason, and served no very definite purpose. As

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many of them belonged to persons not only unconnected by family, but of different names, they no longer served the purpose of distinction when separated from the shield. To this latter class belong the vast majority of modern crests assumed at the suggestion of seal-engravers and coach-painters.

The lion assumed by Richard I., during the crusade in the Holy Land, to express the bravery for which he was proverbial, was borne by Edward III., Henry VII., Edward VI., and James I.; and since that time has been recognized as the appropriate C. of the royal family of England. In early times, the same C. was not always borne even by the same person. Besides the lion, Edward III. occasionally bore a white raven crowned; and other monarchs made use of similar additions. Anciently, the nobility mostly bore plumes of feathers. But several of the earls of Warwick, of the Beauchamp family—the last of whom died in 1445—bore for C. a bear with a rugged staff, muzzled, collared, and chained, as it is still to be seen on signs. The origin of the wreath has been already mentioned. It is now represented as consisting of two stripes of gold or silver lace, twisted into a circular cord. Its tinctures are always those of the principal metal and color of the arms. It is a rule in delineating the wreath, which is shown edgewise above the shield, that the first coil shall be of metal, and the second of color. Civic, triumphal, and other crowns were used as wreaths; and this practice is supposed to have given rise to the use of coronets, out of which crests are sometimes represented as issuing, even in the case of persons who are not noble.

CRESTE, in architecture, an ornamental finishing, either carved in stone, or of tiles running along the top of a wall, or the ridge of a roof. *Crest-tiles*, or, as they are corruptly called, cress-tiles, or crease-tiles, are frequently in the form either of small battlements or Tudor flowers. See Cops.

CRESTED, in heraldry. When a cock or other bird has its comb of a different tincture from its body, it is said to be C. of such a tincture, naming the tincture.

CRESTON, city and co. seat of Union co., Ia., on the Chicago, Burlington and Quincy railroad, 115 m. w. of Ottumwa. There are churches, banks, newspapers, high school, wagon factories, railroad machine-shops, and car-works, stock-yards, large coal chutes, and daily and weekly newspapers. Pop. '90, 7200.

CRES'WICK, Thomas, R.A., one of the best and most popular of recent English landscape-painters, was b. at Sheffield, 1811. He early exhibited a taste for drawing, and in his 17th year removed to London, with a view to study the art as a profession. But already he had so far advanced, that two of his pictures were, during that year, admitted into the royal academy's exhibition. C. loved to paint the beautiful streams, and glens, and wooded dells of his native land; and these, which form the subject of his best paintings, are represented on his canvas with the very fidelity and freshness of nature itself. Among his greatest works are "England," "London Road a Hundred Years Ago," and the "Weald of Kent." He died in 1869.

CRETA'CEOUS GROUP, or Chalk Formation, the upper strata of the secondary series, immediately below the tertiary beds, and resting on the oolite. This group is separated from the eocene tertiary beds by a decided change in both the rocks and fossils. The eocene strata rests unconformably upon the chalk; it is, however, more than probable that a number of beds may yet be discovered to fill up the gap which apparently here exists in the sequence of the rocks.

The C. G. covers a large extent of surface in Europe and the e. of Asia; beds of the period have also been noticed in North and South America. The typical strata occur in the s.e. of England, and are connected with similar beds in the n of France and Germany, and in Denmark. Indeed, the bed of the German ocean seems to be composed of rocks of this group, as is evidenced by the masses of chalk and flint thrown on the shores of Scotland after storms.

The strata of the group have been arranged in the following order. The maximum thickness of the divisions is given in feet.

		Feet.
Upper	1. Maestricht	100
	2. Chalk with Flints	500
	3. Chalk without Flints	600
	4. Chalk Marl	100
	5. Upper Greensand	100
Lower	6. Gault	150
	7. Lower Greensand	850
	8. Wealden beds	1300

1. The maestricht beds (q.v.) consist of pistolitic limestones in the n. of France, and of loose yellowish sandstones in Holland. 2. The chalk with flints is a great mass of pure white pulverulent limestone, usually too soft for a building-stone, but sometimes passing into a more solid state. It occurs in beds of great thickness, with the stratification often obscure, except when rendered distinct by interstratified layers of flint a few inches in thickness, occasionally in continuous beds, but oftener in nodules, and recurring at intervals from 2 to 4 ft. distant from each other. Iron pyrites is found frequently

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in these beds in radiated nodules; it readily decomposes, and produces rusty stains on the rock. 3. Chalk without flints; this differs from the upper chalk only in the want of flints. 4. Chalk marl; the white chalk, by the gradual admixture of argillaceous matter, becomes hardened, until it passes into a pale buff-colored marl or argillaceous limestone, sometimes of a sufficient compactness to be used as a building-stone. 5. Upper greensand (see GREENSAND), composed of alternating layers of sands, clays, and limestones, occasionally, but not always, colored with green particles of a chloritic mineral. 6. Gault (q.v.), a stiff dark clay, used for brickmaking, with many beautifully preserved shells. 7. Lower greensand (q.v.), so like petralogically to the upper greensand, that when the intervening Gault is absent, it is impossible to separate them, except by their organic contents. The Specton clay, a local Yorkshire bed of dark clay, is of the same age. 8. Wealden (q.v.), divided into the two groups, the Wealden clay and Hastings sand, consists of a great series of shales and sandstones, with scattered beds of lime and ironstone.

The most remarkable petralogical characteristic of the group is the chalk, which exists in such abundance as to have given its name to the formation (Lat. *creta*, chalk). It is a white, soft, and pulverulent limestone, consisting almost entirely of carbonate of lime; the only foreign matter in any quantity being silex, which is aggregated together in an amorphous condition, in nodules or layers of flint. Occasional pebbles are also found, but they are extremely rare. Chalk was formerly supposed to be a chemical precipitate: the microscope has, however, shown it to be composed of minute shells mixed with the broken fragments of larger ones; and, very recently, the use of an improved deep-sea sounding apparatus has revealed a sediment now accumulating in many places, which agrees in every point, save solidity, with the chalk. When a piece of white chalk is rubbed down to powder with water, by means of a soft brush, and the powder examined by the microscope, it will be found that the greater portion consists of shells of the minuter kinds of foraminifera, mixed with the disintegrated prisms of pinna or other large shells of like structure, the shells of cytherina, a marine entomostracan, and probably a few diatoms. Deep-sea soundings have disclosed a formation precisely similar, as taking place at the present time. Of some gatherings obtained at a depth of 2 m. from the great Atlantic plateau, prof. Bailey says: "I was greatly delighted to find that *all* these deep soundings are filled with microscopic shells; not a particle of sand or gravel exists in them. They are chiefly made up of perfect little calcareous shells (foraminifera), and contain also a small number of siliceous shells (diatomaceæ)." The occurrence of pebbles in the chalk can easily be accounted for, if we suppose them to have been floated in, attached to the roots of trees, or more probably to sea-weeds. It is more difficult to account for the origin of the flint. Prof. Bailey found that some seas, especially in the Arctic regions, supplied an enormous quantity of siliceous frustules of the diatomaceæ, and spicules of sponges. That such organisms may have been converted into the flint nodules seems very probable, when we remember that many of the nodules have the external conformation of sponges, and show occasionally also the internal structure. Mr. Bowerbank's microscopic examination of flint nodules, seems to lead to the conclusion that all flints are produced from the siliceous skeletons of organic beings. Chalk, then, seems to have been a deposit in very deep seas, far out of the reach of land-currents, which would certainly have brought with them argillaceous and arenaceous débris.

The C. G. is highly fossiliferous. The remains of plants are abundant in the freshwater wealden beds; amongst them have been found fragmentary portions of dicotyledons. If we except the microscopic diatomaceæ, which are not unfrequent in the white chalk, vegetable remains are rare in the other members of the group. The various divisions of the animal kingdom are represented in the organic remains of the chalk, if we except the warm-blooded vertebrata, which have hitherto—if they existed—escaped notice. Foraminifera were enormously abundant in the seas, and active in the secretion of the soluble carbonate of lime, fixing it in their minute shells, which, after their death, as has been shown, formed the principal material of the chalk. In the lower beds, polyzoa have been found in great abundance on the continent. Echinoderms are in immense numbers, and beautifully preserved. Crustacea are occasionally found. Of mollusca, the brachiopoda and cephalopoda are especially abundant, both being pelagic types. Ctenoid and cycloid fishes appear in this group for the first time, though yet in small numbers—the placoids and ganoids being still the predominant forms. Reptiles, though not so numerous as in the former period, were yet far from rare. For further details of the fossils, see DIATOMACEÆ, VENTRICULITES, FORAMINIFERA, TEREBRATULA, RHYNCHONELLA, HIPPURITES, AMMONITES, PTYCHODUS, MOSOSAURUS, PLESIOSAURUS, ICHTHYOSAURUS, PTERODACTYL, etc.

The cretaceous system in North America extends along the Atlantic, s. of New York—where, though mostly hidden by the tertiary formation, it is visible in New Jersey and further s.—around the n. and w. shores of the Mexican gulf, up the Mississippi valley to the mouth of the Ohio, and, on the w., from Texas northward over the sides of the Rocky mountains. Its greatest development is in Wyoming, Utah, Colorado, and w. of the Sierra Nevada in California. In some portions of these last named regions it rises to heights of 10,000 and 12,000 feet. It is found also in Arctic

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America, near the mouth of the Mackenzie river. The American cretaceous beds consist of layers of greensand—called also *marl*, and extensively used in New Jersey and elsewhere for fertilizing land—sands of other kinds, clays, shells, and, on the gulf of Mexico, especially in Texas, limestone. In New Jersey the formation is 400 or 500 ft. thick, in Alabama 2,000, in Texas 800, chiefly solid limestone, in the upper Missouri more than 2,000, and e. of the Wahsatch more than 9,000. In Colorado, New Mexico, and Vancouver's island the formation contains important beds of brown coal or lignite. The coal-beds of Wyoming and Utah, and some southward, are regarded by some geologists as belonging to this formation; others assign them to the tertiary age. Among American cretaceous fossils are included 100 species of the earliest dicotyledonous plants yet found on this continent, half of which are allied with living American forms. Among them are species of oak, willow, poplar, beech, maple, hickory, fig, tulip, sassafras, sequoia, American palm, and cycads. Among the mollusca are species of *terebratula, ostrea, gryphæa, inoceramus, hippurites, radiolites, ammonites, scaphites, hamites, baculites, belemnites, ancyloceras*, and *turrilites*. Of the fishes of the American cretaceous seas nearly 100 species are known. They include large representatives of modern predatory types like the salmon and saury, together with cestracionts and ganoids. The American reptiles of this period are especially remarkable for their number, variety, and size. Cope (who includes, however, in his statement the lignite group, which other geologists rank among the tertiary formations) enumerates 18 species of deinosaurs, 4 pterosaurs, 14 crocodilians, 13 sea saurians, 48 testudinates, and 50 sea serpents. Some of the pterosaurs from the Kansas rocks measured from 20 to 25 ft. in expanse of wing. The sea saurians were from 10 to 50 ft. long. The elasmosaurus Cope describes as a snake-like form 40 ft. long, with an arrow-shaped head on a swan-like neck that rose 20 ft. out of the water. Consequently it could swim many feet below the surface, and yet have its head extended into the air for breath. The American rocks supply 40 species of the sea serpents.

CRETE. See CANDIA.

CRE'TINISM, from *crétin* (French), an idiot of the Alps, and this again probably from *chrétien*, a Christian, one who, from his state of fatuity, could not sin, and was viewed with some degree of religious respect. The name of C. is now applied in a more general sense to idiocy, or defective mental development depending upon local causes, and associated with bodily deformity or arrested growth. C. is very often found in connection with goitre (q.v.), in the lower Alpine valleys, not only of Switzerland and Italy, but of the Pyrenees, Syria, India, and China. In Europe, it is rarely met with at a higher elevation than 3,000 ft., and haunts chiefly the valleys surrounded by high and steep walls of rock, which exclude the light, and limit the free circulation of air. Cretins are always pitiable, and frequently repulsive objects; they are generally dirty, shameless, and obscene; their appetite is commonly voracious; the mouth is large and open, the tongue often protruded, the eyes small, the nose flat and broad, the skull narrow and small in all its dimensions, the forehead retreating, the complexion cadaverous; in addition to which, the whole body is dwarfish, the hands and feet large, the limbs often rickety, the belly protuberant. The cause of C. is still imperfectly understood; the researches of Virchow tend to the conclusion that it is a physical degeneration, dependent on the reception of an undue amount of calcareous matter into the system; and this agrees with the general result of numerous observations previously made, as to the prevalence of goitre and C. in places where calcareous waters are alone accessible to the inhabitants. See GOITER. Many attempts have been recently made to improve the condition of the cretin in childhood, by removing him from the locality of his birth, and by careful training; the institution founded by Dr. Guggenbühl on the Abendberg (q.v.), near Interlaken in Switzerland, having been the prototype of many others on the continent, and of some in England and Scotland, for the education of idiots.

CRETONNE, originally a white cloth of French manufacture, is a name now applied to a printed cotton fabric used for curtains or for covering furniture, which was introduced about 1860. Chintz (q.v.), so much employed for the same purpose in former years, is a comparatively thin printed cloth highly glazed. Cretonne, however, is generally thick and strong, and with a twilled, crape, basket, wave, or other figure produced on the loom. When a pattern is printed on this uneven surface, it has a rich, soft appearance. A cretonne is rarely calendered or glazed. The thick weft threads of inferior qualities are commonly formed of waste cotton, and the patterns upon these, though often bright and showy, are as a rule printed in more or less fugitive colors. Some cretonnes are now printed on both sides with different patterns.

CREUSE, a river and a department in the center of France. The river rises in the mountains on the southern border of the department of C., and flows in a generally n.n.w. direction through that department, then in a n. and westerly direction through Indre, and dividing the departments Vienne and Indre-Loire, falls into the Vienne, a tributary of the Loire, about 12 m. n. of Chatellerault, after a course of about 150 miles.—The department to which the river gives its name lies in lat. 45° 39′ to 46° 26′ n., and long. 1° 24′ to 2° 36′ east. On an area of about 2,200 sq.m., it had a pop., in 1872, of 247,663; at the census of 1896, the pop. was 279,366. Low mountains and chains of hills occupy

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the greater part of the land. The streams, with the exception of the C., are insignificant. The climate is moist and variable, and the soil thin and light in the southern hilly district, which is interspersed with stretches of heath and pasture, but better in the lowlands of the n.e. The products are rye, buckwheat, oats, and potatoes; but agriculture is backward and the rearing of cattle forms the chief branch of rural industry. Large quantities of chestnuts and fruit are grown. The minerals are not important. The people of C. are but slightly educated, and use a coarse patois; but are generally industrious, and annually migrate in large numbers to find work in various parts of France. C. is divided into the arrondissements Aubusson, Bourganeuf, Boussac, Guéret, with Guéret for its capital.

CREUTZ, GUSTAF FILIP, Count, b. Finland, 1731–85; a Swedish poet. He was educated at Abo, where he made the acquaintance and friendship of Gyllenborg, and the two became the "Beaumont and Fletcher" of their country. Creutz's best work was *Atys and Camilla*, a charming idyllic poem. In 1763, Creutz was sent as ambassador to Spain, and afterwards to France.

CREUZER, GEORG FRIEDRICH, a learned German philologer, was b. at Marburg Mar., 10, 1771, and studied there and at Jena. In 1802, he was appointed a professor at Marburg, and in 1804, obtained the chair of philology and ancient history at Heidelberg, which he occupied for 44 years in the worthiest manner. In 1848, he retired into private life, the infirmities of age having forced him to renounce the fatigue of teaching. He died at Heidelberg, 15th Feb., 1858.

C.'s whole life was devoted to the study of antiquity. His first, and probably his greatest work, was *Symbolik und Mythologie der alten Völker, besonders der Griechen* (4 vols., Leip. 1810–12). This treatise, which asserted the symbolical character of ancient mythologies, excited a lively controversy, in which Hermann and Voss appeared as the opponents of Creuzer. His next work in importance was a complete edition of the works of Plotinus (3 vols., Oxford, 1835). Along with G. H. Moser, C. edited several works of Cicero—*De Natura Deorum* (1818); *De Legibus* (1824); *De Republica* (1826); and *De Divinatione* (1828), etc. Between 1837 and 1848, he published a partial collection of his writings in 10 vols. (*Deutsche Schriften.* Leip. and Darms.); the last of which contains an autobiography of C. under the title *Aus dem Leben eines Alten Professors.* He was also the writer of essays on archæological topics too numerous to be mentioned. In 1854, appeared *Friderici Creuzeri Opuscula Selecta.*

CREUZOT, LE, a t. of France, dep. of Saone-et-Loire, 12 m. s.s.e. of Autun. It is situated in the midst of a district rich in coal and iron, and possesses large iron foundries, which turn out cannon, anchors, steam machinery, etc., and which employ a large number of workmen. It is also a seat of glass manufactures. Charbonnière was its former name and it was a small village in 1770, but after the establishment of the iron and coal industries it increased in population and activity. There is a very productive coal seam in the neighborhood. The population, which in 1841 was 4000, in 1891 had reached 18,467.

CREVASSE. See GLACIER.

CRÈVECŒUR (*Heart-breaker*) the name of a former Dutch fort in the province of North Brabant, on the left bank of the Meuse, where this river receives the Dieze, about 4 m. n.n.w. of Bois-le-Duc. It figures somewhat prominently in the wars of the Dutch and Spaniards.

CRÈVECŒUR, HECTOR SAINT JOHN DE, 1731–1813; a French traveler and agriculturist, who settled in New York as a farmer. In the American revolution he was sent to England as a prisoner, was exchanged, and went to Normandy. Afterwards he returned to the United States, and became consul-general for the states of New York, New Jersey, and Connecticut. He found that his wife was dead and his property destroyed, but his children had been protected by a gentleman of Boston. He wrote *Letters of an American Agriculturist; Travels in Pennsylvania and New York;* and a paper on the introduction of the potato into Normandy.

CREVILLEN'TÉ, a t. of Spain, in the province of Alicante, about 20 m. w.s.w. of the city of that name. It is situated at the foot of the hills forming the boundary of Murcia, and has a population of about 10,000, who are chiefly engaged in weaving and in agricultural pursuits.

CREW, of a ship, is a collective name for all the persons employed therein, but usually limited to designate petty officers and seamen only. In men-of-war the entire C. are divided into five groups: 1. Commissioned and warrant officers; 2. Chief petty officers; 3. First-class working petty officers; 4. Second-class working petty officers; 5. Able seamen, ordinary seamen, landsmen, and boys. In the very largest war steamers now afloat, there are upwards of 152 different ranks, grades, or offices among the C., excluding officers and marines.

In a merchant ship, under the new mercantile marine act, the master, before he starts on a voyage, must send a list of his C. to the customs' comptroller at the port of departure, and a similar list within 48 hours after his return. The masters of coasting vessels, however, are required to do this only twice a year. Emigrant officers insist that ships to Australia shall have four seamen as C. to every 100 tons burden, and three to ships bound for America. In the large sea-going steamers, however, the number of

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hands is relatively greater, owing to the various duties relating to the machinery; a steamer of 1000 tons will have as many as 60 or 70 hands, if bound for a long voyage.

CREWE, a t. in the s. of Cheshire, forming a central station of five important railways, to which it owes its present importance. Pop. '81, 24,372; '91, 28,761, chiefly employed in the railway stations, and in the manufacturing of railway carriages and locomotives. It is also an important center for the manufacture of clothing and fustian.

CREWEL-WORK, a kind of embroidery in *crewels*, which are closely twisted colored worsteds. Crewel-work is done mostly for furniture decorations, such as the borders of table covers. The name *crewel* is for *clewel*, from *clew*, a ball of thread.

CREWKERNE, a t. in the s.e. of Somersetshire, in the fertile valley of the Parret and Isle, 10 m. s.s.w. of Ilchester, and surrounded by a wide amphitheatre of highly cultivated hills. Pop. '91, 5000. The chief manufactures are sailcloth, sacking, hair-seating, webbing, and girths. Its weekly markets, and annual fair, which is held on 4th Sept., for sheep, cattle, and horses, are much frequented and well supplied. The word C. means "hermitage of the cross."

CRIBBAGE is a game with cards, played by two, three, or four persons, the whole pack being used. When four persons are engaged, they take sides. The value of the cards is: face cards, ten, ace, one, and the rest as marked; but there are no trumps. The number of cards dealt is usually 5 or 6, the mode of playing the game varying slightly with the number of cards used. The points are scored on a board with holes for pegs, and 61 constitutes game. The terms used in the game are as follow: *Crib*, the cards laid out by each party, the points made by them being scored by the dealer. *Pairs* are two similar cards, as two aces or two kings; they reckon for two points, whether in hand or playing. *Pairs royal* are three similar cards, and reckon six points. *Double pairs royal* are four similar cards, and reckon twelve points. These various points are thus made: If your adversary plays a seven, and you another, a pair is made, which entitles you to two points; if he then play a third seven, he makes a pair royal, and marks six; and if you play a fourth seven, it constitutes a double pair royal, and entitles you to twelve points. When playing the hands, the one whose last card can make it thirty-one scores two points, or the one so near that the following card goes over that number, scores one point. *Fifteens.*—If any combination, whether of two or more cards, in your hand, or in play, make together fifteen, such as a ten and a five, a two, a five and an eight, etc., you reckon two points. *Sequences* are three, four, or more successive cards, and reckon for an equal number of points; and in playing a sequence, it is of no consequence which card is played first; for instance, if your adversary plays an ace, and you a five, he a three, you a two, and he a four, he scores five for the sequence. *Flush* is when the cards are all of one suit, and reckons for as many points as there are cards. A knave of the same suit as the turn-up card counts for one in any hand. If a knave be turned up, it counts two for the dealer.

CRIBBING is a bad habit met with especially in the lighter breeds of horses, and those spending a considerable amount of leisure in the stable. The act consists in the animal seizing with his teeth the manger, rack, or any other such object, and taking in at the same time a deep inspiration, technically called *wind-sucking*. Cribbing springs often from idle play, may be first indulged in during grooming, especially if the operation is conducted in the stall, and the animal be needlessly teased or tickled; is occasionally learned, apparently, by imitation from a neighbor; and in the first instance is frequently a symptom of some form of indigestion. Its indulgence may be suspected where the outer margins of the front teeth are worn and rugged, and will soon be proved by turning the animal loose where he can find suitable objects to lay hold of. It usually interferes with thriving and condition, and leads to attacks of indigestion. It can be prevented only by the use of a muzzle or throat-strap; but in those newly acquired cases resulting from gastric derangement, means must further be taken to remove the acidity or other such disorder.

CRICE'TUS. See HAMSTER.

CRICHTON, JAMES, surnamed the "ADMIRABLE," was a native of Scotland, where he was b. in 1551, or, according to others, in 1560. His father, Robert Crichton of Elliock, in the co. of Perth, was lord advocate of Scotland from 1561 to 1573. On the mother's side, C. was descended from the old Scottish kings, a circumstance of which he used to boast on the continent. He was educated at St. Andrews university. Before he reached his 20th year, he had, it seems, "run through the whole circle of the sciences," mastered ten different languages, and perfected himself in every knightly accomplishment. Thus panoplied in a suit of intellectual armor, C. rode out into the world of letters, and challenged all and sundry to a learned encounter. If we can believe his biographers, the stripling left every adversary who entered the lists against him *hors de combat*. At Paris, Rome, Venice, Padua, Mantua, he achieved the most extraordinary victories in disputation on all branches of human knowledge, and excited universal amazement and applause. The beauty of his person and the elegance of his manners also made him a great favorite with the fair; while, as if to leave no excellence unattained, he vanquished, in a duel, the most famous gladiator in Europe. The duke of Mantua, in whose city this perilous feat was performed, appointed him preceptor to his son, Vincentio di Gonzago, a dissolute and profligate youth. One night, during the carnival, C. was attacked in the streets of Mantua by half-a-dozen people in masks. He

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pushed them so hard that their leader pulled off his mask, and disclosed the features of the prince. With an excess of loyalty which proved his death, C. threw himself upon his knees, and begged Vincentio's pardon, at the same time presenting him with his sword. The heartless wretch plunged it into the body of his tutor. Thus perished, in the 22d year of his age, the "Admirable Crichton."

What measure of truth there may be in the hyperbolical eulogies of his biographers, it is impossible to determine.

CRICKET (*gryllus; acheta* of some naturalists), a genus of orthopterous insects, of the section *saltatoria* (in which the hinder legs are long, very strong, and formed for leaping), allied to locusts and grasshoppers, and the type of a family *gryllidæ* (or *achetidæ*). The wings are folded horizontally, and form, when closed, a slender thread-like acumination beyond the wing-covers. It is supposed to be by friction of the wing-covers against each other, and from a peculiarity of their structure, that the males produce the stridulous sound which makes these insects so well known. The antennæ are long and thread-like, inserted between the eyes. The best known species is the HOUSE C. (*G. domesticus*), which is about an inch long, with antennæ of almost an inch and a half, of a pale-yellowish color, mingled with brown. It is widely distributed over Europe, particularly the south, and is common in Great Britain. Its very frequent abode is in nooks and crevices of houses, and it sometimes burrows in the mortar; the neighborhood of the fire is very attractive to it, particularly in winter; and its merry note has, accordingly, become associated with ideas of domestic comfort and cheerfulness. Without the heat of fire, it becomes dormant, or nearly so, in winter. It remains quiet during the day, but is lively and active at night, issuing forth to seek its food, which consists both of animal and vegetable substances. Bread-crumbs are very acceptable to it; and for the sake, apparently, both of food and warmth, it very much frequents bakehouses. The larvæ are wingless, the pupæ have mere rudimentary wings.—The FIELD C. (*G. campestris*) is larger, blackish, with the base of the wing-covers yellowish, feeds on herbs and roots, makes a louder noise than the house C., and is not unfrequent in some parts of America, but very rare in Scotland.—A species of C. (*G. megacephalus*) found in Sicily, makes a noise loud enough to be heard at the distance of a mile.—The MOLE C. (*gryllotalpa*) will be noticed in a separate article. See illus., BEETLES, ETC., vol. II.

CRICKET (of doubtful derivation), a well-known game, is of very ancient date. The author of the *Cricket Field*—one of the best manuals on the subject—believes it to be identical with "club-ball," a game played in the 14th c.; it went originally by the name of "handyn and handoute." C. is a truly national English game. There is hardly a town, village, or school, that does not own its C. ground, and military authorities hold it in such estimation as a healthy recreation, that soldiers are encouraged to occupy their leisure time in its pursuit. Of late years C. has been introduced largely into Scotland and Ireland, and is rapidly becoming naturalized all over the world. The requirements for carrying on the game are—1st, a piece of level turf an acre or two in extent; 2d, a sufficient number of players to form two sides of eleven each, for *double* wicket, and a lesser number for *single* wicket; 3d, for double wicket (the mode in which the game is usually played), two bats, two sets of wickets and bails, and a ball. When a match is to be played between two "elevens," the first thing to be done is to "pitch" the wickets. *Wickets* consist of six wooden stumps, 27 in. high, and are placed in the ground in sets of three, at a distance of 22 yards apart. On the top of each set of stumps are placed two small pieces of wood, called *bails*. The rival sides next toss for first "innings," and the director of the side that is to go in first, places two of his men at the wickets as batters; while a bowler, wicket-keeper, long stop, and fielders are placed in their several positions by the director of the opposite side. When these arrangements are satisfactorily made, and the markers or scorers are at their post, the umpires take their places, and the game begins. It may be well to mention here that the relative merits of rival sides are decided by the total number of *runs* made by each eleven batters during two innings—the side whose players score the most being, of course, victorious.

We may further premise that the bowler's object is to direct his ball, by a swift movement of the arm, towards the opposite wickets, at which one of the batsmen stands, and, if possible, to strike down the stumps or knock off the bails; while the object of the batsman, on the other hand, is to protect his wickets from the bowler's attack, by either stopping the ball when it reaches him (blocking), or driving it out to the field. And much of the beauty of the game depends upon the precision with which the bowler can direct ball after ball in a straight line for the wickets, and the corresponding skill displayed by a good batsman in guarding them.

We will now suppose the two batsmen to be at their places, the bowler at his, ball in hand, and the other players arranged in theirs: at a signal from the umpire the bowler cries "play!" and immediately after, *delivers* his first ball. If the batsman misses the ball, and it passes the wicket, the wicket-keeper stops it, and returns it to the bowler, who delivers another ball, and so on. When the batsman strikes the ball fieldwards, he immediately runs to the opposite wicket, passing his companion batsman, who crosses to his, and so on, till the ball has been returned by a fielder to the wicket-keeper or

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bowler's hand. Thus, if the stroke be a long one, the striker may have time to run perhaps three times between the wickets before the ball is thrown up, when three "runs" are accordingly placed at his name by the scorers, on their sheet. If, however, the bowler or wicket-keeper receives the ball, and touches the wickets with it, before the advancing batsman has reached his "ground" or touches it with his bat, the striker is out, and another man takes his place. Besides, if a ball from a stroke of the bat be caught by one of the opposite party before it reaches the ground; or if in striking at a ball the striker hits down his wicket; or if he willfully prevents a ball being caught, or strikes it twice; or if any part of his person stops a ball which would otherwise have hit his wicket, the striker is out. It frequently happens that two skillful batsmen guard their wickets so effectually, and score so many runs, to one particular style of bowling, that a change either of the bowler, or style of bowling, is adopted by the other side. This change, say from swift to slow bowling, or *vice versâ*, generally produces the required results, and leads to the speedy retirement of the hitherto fortunate batsmen.

The wicket-keeper's place is a very important one, his principal duty being to stop with his hands every ball the batsman misses, it being allowable to make runs (byes) for balls that elude his grasp. Behind him stands the long stop, who is always on the outlook for balls that escape the wicket-keeper. The fielders, who are posted in various parts of the ground, ought to possess quickness of eye and foot, and skill in picking up with either hand a ball that is running, and instantly throwing it to the wickets. They must also be well skilled in catching balls. Much depends on their judgment of distance between the point at which the ball is picked up, and the wickets, as misconception of this may lead to overthrowing the ball, or throwing it short, while the batsmen are profiting by the error, and scoring additional runs. Fielders usually throw the ball to the wicket-keeper, who returns it slowly to the bowler; this saves the hands of the latter from being unsteadied by catching long balls.

At the end of every four bowls, the bowler, wicket-keeper, long-stop, and fielders, change places, and thus every four balls are delivered from alternate wickets; four balls constitute an "over," which it is the umpire's duty to reckon and announce.

We have said that each side is allowed *two* innings, but it sometimes happens that one side scores more runs in one innings than the other does in two; thus, A's side, we will suppose, goes in first, and its eleven men score 180; B's side then goes in, and scores, say, 80 the first innings, and 70 the next: in that case, A would be said to have won by an innings and 30 runs.

In England, there are many professional men who make a livelihood by playing matches with amateur clubs, and by instructing the latter in the art. The Marylebone club is the parliament of cricket, and its laws are recognized as the only genuine code all over the world; and for skill and science, the "Eleven of all England," and the "United Eleven" (professionals), excel all other cricketers in the world. The attractions of C. are rapidly spreading. In America and Australia, the game is played to a large extent, and with skill almost equal to that of the English players. English elevens have crossed the ocean more than once to compete with the principal American and Australian clubs, and have returned to England covered with laurels. Good works on C. are *The Cricket Field* (Lond. Longmans), *Felix on the Bat*, Lillywhite's *Guide to Cricketers* (Lond. Kent & Co), and *Cricket* in the Badminton series (1888).

CRICKLADE, an agricultural t. and parliamentary borough, in the n. of Wiltshire, 7 m. s.e. of Cirencester, on the right bank of the Thames. The town of C. consists of one long street. The government is in a high-bailiff, appointed by the town. It has a considerable retail trade; and the market for fat cattle, held on the third Thursday of each month, is well attended. The parliamentary borough called C. includes, besides its own two parishes of St. Mary and St. Sampson, many other parishes or parts of parishes, comprising a large and rich agricultural district, which returns two members to the house of commons. Pop. of parliamentary borough (1891), 59,400; of the town, '91, 11,832.

CRIEFF—including the burgh of barony of C. and the burgh of regality of Drummond—a t. on the Earn, 17 m. w. of Perth. It is beautifully situated at the foot of the Grampians, near the entrance to the Highlands. Pop. '91, 4901. It has woolen manufactures, besides tanneries. The climate of C. makes it the resort of invalids in summer, and there is a superior hydropathic establishment, with accommodation for 200 visitors. It is eminent for its schools. St. Margaret's college was opened here in 1849, for the education of young ladies of the Episcopal communion. Near is the fine scenery of Glen Almond, with Trinity college, opened in 1847, for Scottish Episcopal students. Morrison's academy—built at a cost of £6,500, and endowed by Thomas Morrison, builder, Edinburgh, with £20,000—was opened in 1860. C. is the terminus of two branches of the Caledonian railway, and since the opening of the first in 1856 it has much improved. The greatest Scotch cattle-market stood here till 1770, when it was removed to Falkirk

CRILLON, Louis de Berton des Balbes, surnamed "Le Brave," was b. at Murs, in Provence, in 1541. Under Francis of Lorraine, duke of Guise, then the model of military chivalry, he was trained for war, and, at the age of 16, was accounted an accomplished soldier. In 1558, he gave the first public proof of his valor at the siege of

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Calais. Shortly after, he covered himself with glory at the capture of Guines. The whole army celebrated the praises of the young hero, who was introduced by duke Francis in flattering terms to Henry II. As a reward of his numerous heroic deeds, he obtained a multitude of church benefices, which he intrusted to the care of learned clerks. In the religious wars of the 16th c., he fought against the Huguenots, and distinguished himself at the battles of Dreux, Jarnac, and Moncontour He was likewise present at the battle of Lepanto, in 1571, and, though wounded, was appointed to carry the news of the victory to the pope and the French king. In the atrocities of the St. Bartholomew massacre, C. had no part. In 1573, he took part in the siege of La Rochelle. In 1585, Henry III. made him knight of his orders. He continued faithful to his sovereign in his struggle with the Catholic league. Henry IV. found in him a sincere friend and adviser. After the peace with Savoy, C. retired to Avignon, and, after the fashion of a true Catholic warrior, ended his days "in the exercises of piety and penance," Dec. 2, 1615. The martial fire burned brightly in C., however, even in his last days; in proof of which, there is recorded the rather melodramatic story, that when listening at church one day to an account of the crucifixion, the old hero forgot himself, and, brandishing his sword, cried out, "Où étais tu, Crillon?" (Where wert thou, Crillon?)

CRIME, in its legal, as opposed to its moral or ethical sense, is an act done in violation of those duties for the breach of which the law has provided that the offender, in addition to repairing, if it be possible, the injury done to the individual, shall make satisfaction to the community. A private wrong, or civil injury, on the other hand, is an infringement on the rights of an individual merely, for which compensation to him is held, in law, to be a complete atonement. From this definition, which is that generally adopted by lawyers (Stephen's *Com.*, iv. p. 77), it is obvious that legal criminality is not a permanent characteristic attaching to an action, but one fixed upon it arbitrarily, from considerations of expediency. Without changing its moral character, the same action may, and very often is, a C. in one country or in one generation, and no C. in another country or a succeeding generation. Malice, or evil intention, however, is in all cases essential to the character of C., for, though there may be an immoral act which it is inexpedient to punish as a C., it can never be expedient to punish as a C. what is not an immoral act. But it is not necessary that the evil intention shall have had reference to the party injured. If the offender acted in defiance of social duty, and regardless of order, a C. has been committed, though it may not have been the particular C. which he intended. For example, it is murder if A kill B by mistake for C, unless the killing of C would have been justifiable, or excusable. The law can take no cognizance of a bare intention, which has not ripened into any sort of act. How far *attempts* to commit C. are punishable, is always a question of difficulty. The general rule seems to be, that if such acts can be unequivocally connected with the criminal intention, they are punishable, though not to the same extent as the completed crime. Pupils under seven years of age, and insane persons, as being incapable of design or intention, are regarded in the eye of the law as incapable of C.; but questions as to the responsibility of persons laboring under partial insanity are often surrounded with practical difficulties, which are positively insoluble. The defense of *compulsion*, or *vis major*, as it is called by lawyers, if completely established in fact, is generally sufficient in law. See COMPULSION. The subjection of a servant to a master, or of a wife or child to a husband or parent, will be no defense for the commission of an act of the criminality of which the offender was aware, unless it amount to compulsion. Magistrates acting *bonâ fide*, and soldiers acting under their officers in the ordinary line of duty, are not liable to a criminal charge. Extreme want is no excuse for a C. in law, though it furnishes a ground for an application for mercy.

In the technical language of the law of England, the term *offense* has a wider signification than C., the latter including only such of the former as are punishable by *indictment* (q.v.). Crimes are divided into *misdemeanors* (q.v.) and *felonies* (q.v.), the latter being a higher species of offense than the former.

CRIME'A (anciently, the Tauric Chersonese), a peninsula in the s. of Russia, forming part of the government of Taurida, in latitude 44° 44′ to 46° 5′ n., longitude 32° 30′ to 36° 35′ e. It is united to the mainland only by the very narrow isthmus of Perekop, between the Black sea and the sea of Azof, and separated from the isle or peninsula of Taman, on the e., only by the narrow strait of Yenikalé. The C. is thus almost surrounded by water—on three sides by the Black sea, and on the fourth by the sea of Azof; while a trench, 70 ft. wide and 25 deep, across the isthmus of Perekop, cuts it off from the mainland. The C. is quadrilateral in shape, the four corners pointing to the four cardinal points in the compass; but a long narrow peninsula juts out on the e., which increases the extreme length of the territory from east to west to nearly 200 miles, the breadth being 110 miles. The whole extent of the C. is 9,773 square miles. The coast is very much broken and indented, particularly on the side of the sea of Azof. The most easterly part of it is a mountainous peninsula, the seat of the ancient kingdom of Bosporus. From the strait of Yenikalé, through this minor peninsula and along the whole southern coast, a chain of mountains extends, which

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may be regarded as a continuation of one of the chains proceeding from Mt. Caucasus. This southern district of the C. is very rich and beautiful. The mountains rise with steep slopes from the sea, whilst spurs and secondary chains extend northward, richly wooded, and with most beautiful intermediate valleys, gradually sinking into the uniform and desolate steppe which forms the northern and much greater part of the peninsula. The highest mountain is Tchatirdagh, i.e., the Tent mountain, *Mons Trapezus* of the ancients, which rises to a height of more than 5000 feet. It is a table-mountain, and has many great and deep chasms, in some of which the ice remains unmelted all the summer. The southern district of the C. is well cultivated, and is adorned by many country-seats of the Russian emperor and nobles, with parks and gardens surpassed by none in Europe. Tartar villages, mosques, and Greek convents are to be seen in most picturesque situations amongst the woods and rocks, with many ruins of ancient fortresses. The vegetation may almost be called subtropical; olive groves are frequent; the vineyards yield excellent grapes, and some of them excellent wine; and even oranges are produced. Grain of various kinds is produced abundantly, and silk, wax, and honey. Much attention is bestowed upon horses, oxen, and sheep, in which no small part of the wealth of the country consists. The northern part of the C. is in every way a contrast to the south, being little else than one waste uniform steppe, destitute of water and of wood, with a soil generally very unfit for agriculture, and with numerous salt-lakes and salt-marshes, some of which dry up in summer, and which seem to indicate that it was recently covered by the sea. The air is infected by exhalations from these marshes, and from the *Siwash* or *Putrid sea*, which is a portion of the sea of Azof, but is almost cut off from it by a narrow tongue of land called the peninsula of Arabat. In the summer and autumn, a most offensive and powerful smell arises from the stagnant water, but the evaporation is often so complete that the Siwash is left dry, and horses can cross upon the hardened ground, where at other seasons vessels may sail. The capital of the C. is Simferopol (q.v.); the old Tartar capital is Baktshi-serai (q.v.), both situated in the interior. Sevastopol (q.v.) is situated in the s.w.; Kaffa and Kertch are situated in the s.e.; Perekop on the isthmus to which it gives its name, in the north. The C. is now directly connected with the Russian railway system, lines diverging to the s.e. coast and s.w. The small river Alma, on whose banks the first battle was fought between the Russian troops and the French and English invading army (20th Sept., 1854), falls into the Black sea, where the picturesque southern district approaches the northern steppe.

The population of the government of Taurida was (1894) 1,247,159, a large part of whom are Tartars; the remainder are Russians, Germans, Greeks, etc. The chief features in the early history of the C. are given under the head Bosporus (q. v.). The Tartars conquered the territory in the 13th c., and converted it into the khanat of Krim Tartary. The Genoese under these rulers planted flourishing colonies here, which were destroyed by the Turks, who came into possession of the country in the 15th century. Russia finally subjected the C. in 1783. See RUSSIA.

CRIME'AN WAR, begun in 1853. As the French and Russian governments had taken sides in the contention between the Latin (or Roman) and Greek (or Russian) churches for exclusive possession of the holy sepulcher and other sacred places, the czar sent prince Menschikoff to Constantinople Feb. 28, 1853, as envoy extraordinary. In addition to the claims with regard to the holy places, he made certain demands respecting the protection of the Greek Christians in Turkey. As to the holy places, the sultan recommended a mixed commission, which decided in favor of the Greek church. The demands of Menschikoff with respect to the Greek Christians in Turkey were not acceded to, and the envoy left Constantinople May 21. Two weeks later, the sultan confirmed all the rights and privileges of the Greek Christians, and appealed to his allies. In June, the French and English fleets appeared. A week later the Russians crossed the Pruth into Moldavia. Diplomacy was then renewed, and a conference at Vienna was agreed to by all except the sultan, who demanded modifications which Russia refused. About the middle of Sept., 1853, four English and French war-vessels entered the Dardanelles, and on Oct. 5, the sultan declared war against Russia. The first real act of war occurred Oct. 23, when a Turkish fortress fired on a Russian flotilla. Nov. 1, Russia declared war against Turkey. Then followed in and around the peninsula of the Crimea a series of battles through about 26 months. The chief of them in the order of time were the battles of the Alma, Sept. 20, 1854, when the English, led by lord Raglan, and the French under marshal St. Arnaud, routed the Russians, who lost 5,000 men, of whom less than 1000 were prisoners; loss of the allies, 3,400. Sept. 25, the allies took Balaklava. Oct. 17, they began an unsuccessful siege of Sebastopol. The battle of Balaklava—with the celebrated charge of the light brigade—occurred Oct. 25. On Sept. 8, 1855, the French captured the Malakoff by assault, and the Russians, sinking their fleet, retreated from Sebastopol. There was little more of important fighting; peace was concluded Mar. 30, 1856, and July 9 the allies evacuated the Crimea. The losses of the allies in the entire campaign were—English, killed or died of wounds, 5,000; died of cholera, 4,244; from other diseases, 16,000; total, nearly 24,000, besides 2,873 disabled. The British public debt was increased more than $200,000,000. The French lost about 63,500 men; and the Russian loss has been estimated as much more than that of all the allies. See Kinglake's *Invasion of the Crimea* (1863–87).

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CRI'MEN REPETUNDA'RUM, the crime of accepting a bribe by a judge. See BARATRY; JUDGE.

CRIMINAL, one who has been convicted of a crime. A person indicted for a criminal offense is often called a culprit in England; and when undergoing trial in the court of justiciary in Scotland, he is spoken of as the panel, a word which has a different signification in America. See PANEL.

CRIMINAL CONVERSATION. See ADULTERY.

CRIMINAL COURTS. See JUSTICIARY, COURT OF.

CRIMINAL INFORMATION. See INFORMATION.

CRIMINAL LAW. See CRIME, PROSECUTION, PROSECUTOR.

CRIMP is the name given to an agent for supplying ships with seamen, just before a voyage; he receives so much per head for his trouble. This offensive name is applied to these persons, because in general they make use of untruthful representations and other unfair means to entrap sailors into service. Crimps are numerous in all large seaports, and are usually in league with publicans and prostitutes to deprive seamen of their wages. They also keep a sharp look-out for emigrants, and convey all who are simple enough to put faith in their statements to low lodging-houses in which they have an interest. The mere charge for lodging is often small, but the lodgers are cheated by provision-merchants and others who pay the C. a liberal commission on their custom. Fairly conducted, the C.'s business is no more objectionable than any other agency, and within recent years the system has been greatly improved by the operation of the "passengers' act" and "mercantile marine act," and especially by the appointment of registrars of seamen and government emigration agents.

CRIMSON. See RED COLORS.

CRI'NAN CANAL, THE, is an artificial water-communication 9 m. long, in the w. of Argyleshire, between loch Gilp, a branch of loch Fyne, and loch Crinan, in the sound of Jura, at the head of the peninsula of Cantire. It was constructed to avoid the circuitous passage of 70 m. round the Mull of Cantire, on the route from Glasgow to Inverness by the Caledonian canal. It is 24 ft. broad, and 12 deep, has 15 locks, and admits vessels of 200 tons. It was excavated at the beginning of the nineteenth century, and cost £183,000. After a continuance of heavy rain in Feb. 1859, the three reservoirs supplying the canal with water (the highest being 800 ft. above the canal) burst, and a torrent of water rushed down the mountain-slope, washed away part of the canal banks, and filled the canal with débris and stones for upwards of a mile. Government repaired the damage at the cost of £12,000.

CRINED (Lat. *crinis*, the hair), a term in heraldry. When the hair of a man or woman, or the mane of a horse, differs in tincture from the rest of the charge, the object is said to be *crined*, of such a metal or color.

CRINGLES, short pieces of rope, with each end spliced into the bolt rope of a sail; commonly confining an iron or brass ring or thimble. Smaller ropes are passed through them, to aid in managing the sails.

CRINOI'DEÆ (Gr. lily-like), an order or family of radiate animals of the class *echinodermata* (q.v.), of which the recent species are few, but the fossil species so very numerous as to constitute great tracts of the dry land as it now appears. The C. have a central disk, in which is contained the digestive cavity, with two orifices, and from which arise arms or rays, five in number, but soon subdividing, so as at first sight to appear more numerous, and again subdividing into lateral appendages, either fin-like or filamentous, the disk as well as the rays and their subdivisions formed of a calcareous jointed skeleton, clothed with a fleshy integument, of which the fin-like expansions are formed, and which is thicker than in star-fishes, and contains imbedded in it the innumerable ovaries. The joints are also extremely numerous, and the subdivision of the rays often very great. The disk is composed of calcareous pieces and fleshy integument like the rays, as is also a stalk on which the whole is usually supported; the base, it is supposed, being fixed, and the disk and rays expanding like a flower. It appears probable that many of the fossil C. were permanently fixed in this manner, and this is supposed to be the case with the species of *pentacrinus* still existing, as the *P. caput Medusæ*, or Medusa's head of the West Indian seas; but others are fixed only when young, the disk and arms finally becoming detached from the stalk and moving freely in the sea, swimming in a manner analogous to that of the medusæ. This interesting fact was first discovered by Mr. J. V. Thompson, who found in the sea near Cork the stalked young of the *comatula rosacea*, a small but very beautiful species, and the only species of the C. found in the British seas. See ENCRINITES.

CRINOLINE (Fr., from Lat. *crinis*, hair) was the name originally given by the French *modistes* to a fabric made of horse hair, capable of great stiffness, and employed to distend women's attire; it is now applied in a general way to those structures of steel wire or hoops, by means of which women some years ago attained such overwhelming dimensions. This fashion of expansion is not new. The first name we find given to it is the *farthingale*, introduced by queen Elizabeth. Walpole, in his fancy description of her,

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speaks of her "enormous ruff and vaster fardingals." The upper part of the body was incased in a cuirass of whalebone, which was united at the waist with the equally stiff fardingale of the same material, descending to the feet, without a single fold, in the form of a great bell. Gosson mentions the fardingale in 1596, in his *Pleasant Quippes for Upstart Newfangled Gentlewomen*. In the end of the reign of James I., this fashion gradually declined, and was further tamed down by Puritan feeling in the time of Charles I. and Cromwell, till it quite disappeared. We next hear of it in 1711 as "that startling novelty the hoop petticoat," which differed from the fardingale in being gathered at the waist. Sir Roger de Coverley is made to say of his family pictures: "You see, sir, my great-great-grandmother has on the new-fashioned petticoat, except that the modern is gathered at the waist; my grandmother appears as if she stood in a large drum, whereas the ladies now walk as if they were in a go-cart." Hogarth, in his night-scene in "Marriage à-la-Mode," introduces on the floor a hoop of the time of George II.; and about 1744, hoops are mentioned as so extravagant, that a woman occupied the space of six men. An elongated oval form also came into fashion, raised at each side to show the high-heeled shoes, causing caricaturists to say that a lady looked like a donkey carrying its panniers. These hoops were of whalebone, with canvas over them, having capacious receptacles on each side for articles of convenience. In 1780, we find hoops of cane used, being advertised to "out-wear the best sort of whalebone." About the year 1796, hoops had been discarded in private life, but were still the mode at court, and never had been seen in more full-blown enormity, continuing so to the time of George IV., when they were abolished by royal command.

We now come to the development of this fashion about the middle of the present century; which began with C. in its original and proper sense, first in the form of the inelegant "bustle" in the upper part of skirt, then the whole petticoat. Instead of the hair fabric, some used, for economy, cotton, thickly corded and starched. The *Spectator* dealt out much cutting though playful raillery on the hoops of his day, but apparently with little effect; and equally unavailing were the satires of *Punch* and other caricaturists of the 19th century against the hideous fashion of crinoline. The hoops were sometimes made with a circumference of four and even five yards. At last, after indignation and ridicule had for years assailed the monstrosity in vain, and when people had given over speaking about it, the inflation began, about 1866, without any apparent cause, to collapse; and, rushing to the opposite extreme, ladies might be seen walking about as slim as if merely wrapt in a morning-gown.

CRINUM, a genus of bulbous-rooted plants of the natural order *amaryllideæ*, having long tubular flowers, the segments of the perianth hooked at the apex, the stamens straight and inserted into the tube, and a three-celled capsule. It contains a considerable number of species, natives of different tropical and subtropical countries, generally with umbels of large and beautiful flowers, some of them amongst the most admired ornaments of our hot-houses. *C. amabile*, an Indian species, is much esteemed.

CRIPPLE CREEK, a town in El Paso co., Col.; on the Florence and Cripple Creek and the Midland Terminal railroads; 25 miles w. by s.w. of Colorado Springs. It was founded in 1890 as a mining town; developed rapidly after 1893; and was nearly destroyed by fire in 1896. The district in which it is situated is a complete net-work of gold-bearing veins, and mining gave rise to the subsequent founding of Anaconda, Victor, Altman, Independence, Lawrence, and other nearby towns. Within six months in 1897 twelve new mines were opened and worked on Beacon hill in this district, and all signs indicated a continually increasing shipment of ore. Cripple Creek town has a national bank, daily and weekly newspapers, and (1897) a population estimated at 10,000, with probably 35,000 in the district.

CRIS-CROSS ROW. See CHRIST-CROSS ROW.

CRISIS (Gr. a judgment, from *krino*, I judge), a name used by the ancient physicians to denote the rapid or sudden determination of an acute disease in the direction of convalescence or of death. It was opposed in signification to lysis (*luo*, I relax), which denoted the gradual subsidence of the symptoms noticed in most chronic and in some acute diseases. The doctrine of crises was closely bound up with that of a *materies morbi*, or material of disease in the blood, which was presumed to be undergoing changes, during the whole course of the malady, tending to an evacuation of some kind from the system in the form of a critical discharge (*apostasis* or *abscess*), which, when observed, was supposed to contain the matter of disease in a state of *coction*, and to be the direct cause of the sudden relief of the patient. Thus, according to the character and seat of the critical discharge, it was common to speak of a C. by sweating, by diarrhea, by expectoration, by urine, by parotid swellings, etc.; and no C. was considered regular that was not attended by some symptom of this kind. Another curious doctrine associated with that of crises, was the belief in certain days as ruling the beneficent or injurious, the complete or incomplete character of a crisis. The seventh, fourteenth, and twentieth (according to some, the twenty-first) days of the disease were regarded as eminently critical; less so, but still favorably critical, were the third, fifth, eleventh, and seventeenth; the fourth day was the *indicator* of a complete C. on the seventh; the sixth day was the *tyrant*, notorious for unfavorable crises; the second, eighth, tenth, thirteenth, and the rest were non-critical. Few physicians now attach much importance to critical days, but the doctrine of crises and of a *materies morbi* is still taught.

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CRISP, CHARLES FREDERIC, b. England, 1846, and came to the U. S. as a child. He served in the Confederate army (1861–64), and was made prisoner in the last-named year. In 1882 he was elected to Congress from Georgia, as a democrat; served there till his death in 1896. He was elected speaker in 1891 and 1893. D. 1896.

CRISPI, FRANCESCO, was born in 1819 at Ribera, in Sicily; studied law and was admitted to the bar at Naples, where he became a member of the conspiracy which led to the overthrow of the Kingdom of the Two Sicilies in 1848. Not satisfied with this, his revolutionary spirit made him a chief promoter in the insurrection of Palermo. After the victory gained by the Swiss regiments, Sig. Crispi fled to France, but organizing a new revolution in 1859–60, he joined Garibaldi. Later he began his labors for the annexation of the Two Sicilies to the Kingdom of Italy. As a reward of his efforts he was made by Palermo its first representative to the Italian Parliament. He took immediately a prominent position, and was the acknowledged leader of the constitutional opposition. Sig. Crispi was chosen deputy at the elections of 1876, and in the same year elected President of the Chamber of Deputies. In 1887, he became Prime Minister, and has been an earnest advocate of the TRIPLE ALLIANCE (q. v.) between Germany, Italy, and Austria. His policy was approved by an overwhelming majority of the electors in 1890, but his ministry was overthrown on a financial question in Feb. 1891. In 1893 he resumed the office of premier and held it till the defeat of the Italians in Abyssinia in 1896, when he was succeeded by the Marquis di Rudini (q. v.).

CRISPIN, a saint and martyr, was descended from a noble Roman family. About the middle of the 3d c., under the reign of Diocletian, he, along with his brother Crispianus, fled from Rome into Gaul, where he worked as a shoemaker in the town which is now called Soissons, and distinguished himself by his exertions for the spread of Christianity, as well as by his works of charity. According to the legend, his benevolence was so great that he even stole leather to make shoes for the poor! From this, charities done at the expense of others have been called Crispinades. In the year 287, he and his brother suffered a most cruel martyrdom. Both brothers are commemorated on the 25th Oct. King Crispin, as he is called, is the universally recognized patron saint of shoemakers, and is represented with dramatic effect in the ceremonial processions of the "gentle craft." There is an amusing but scarce book about shoemakers, entitled *Crispin Anecdotes*.

CRISPIN, KNIGHTS OF SAINT, a society of shoemakers organized in Wisconsin, in 1866, to protect the interests of workingmen against employers, regulate wages, and sustain unemployed and sick members and their families. It has extended to other parts of the country and comprises a large membership.

CRITIAS, an Athenian orator and poet, one of the thirty tyrants. He was a political agitator and disturber of the peace, and became so troublesome that he was banished by the people. Returning to Athens he was made ephor by the oligarchical party, and was one of the most cruel and unscrupulous of the thirty who in 404 B.C. were appointed rulers of the Lacedæmonians.

CRITICISM, the act and art of passing judgment according to a right standard upon any literary, artistic, philosophical, or mechanical work, and pointing out its merits and defects. It is the outgrowth and aid of literature and art; valuable in proportion as it is intelligent, impartial, thorough, and free from prejudice and passion. Criticism was exercised in ancient times by men of the highest eminence, among whom were Aristotle, Horace, and Quintilian. Some of the greatest critics of modern times in England were Dryden, Pope, Johnson, Coleridge, Hazlitt, Mackintosh, Hallam, Brougham, and Macaulay. Boileau, Voltaire, Saint-Beuve, and Taine may be reckoned among the eminent critics of France; while Germany has had a host, among whom should be mentioned Lessing, Goethe, Schlegel, and Kant. There was but a narrow field for criticism in the United States during the first fifty years after the revolution, but it has widened rapidly since. The earliest workers in this field were Prof. Andrews Norton and Prof. Levi Frisbie, of Cambridge, Willard Phillips, Samuel Gilman, and Richard H. Dana. Among those of a later day may be mentioned William Ellery Channing, Francis Gray, Edward and Alexander Everett, John G. Palfrey, George Ripley, George Bancroft, William H. Prescott, Prof. Francis Bowen, James Russell Lowell, Charles Norton, Edwin P. Whipple, and George S. Hillard. In the department of theological and biblical criticism Moses Stuart, Charles Hodge, Bela B. Edwards, and Charles A. Briggs have distinguished themselves. In recent years the number of critics in various departments has greatly enlarged, and much of their work is of a high order.

CRITICISM, THE HIGHER BIBLICAL. See HIGHER CRITICISM, THE.

CRI'TO, a friend of Socrates, who assisted the philosopher with material aid, arranging for his escape from prison. He was a writer on philosophy, but none of his works are extant.

CRITTENDEN, a co. in e. Arkansas on the Mississippi river, intersected by the Kansas City, Fort Scott, and Memphis, and other railroads; about 614 sq. m.; pop. '90, 13,940, includes colored. Co. seat, Marion.

CRITTENDEN, a co. in w. Kentucky on the Ohio river, bounded on the s. w. by the Cumberland; 340 sq. m.; pop. '90, 13,119, includes colored. Co. seat, Marion.

CRITTENDEN, JOHN JORDON, 1787–1863; b. Ky., a U. S. senator from that state. He was a lawyer of great ability. In 1841 he was appointed attorney-general by Presi-

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dent Harrison, but he resigned when Tyler became president. In 1842 he was sent to the senate. In 1848 he resigned and was chosen governor of Kentucky. When Fillmore was president, he was again attorney-general, and in 1855 he was again sent to the senate. In the late civil war, he was one of the few southern statesmen who stood firmly by the union. His last public speech was in opposition to a conscription bill then before congress.

CRITTENDEN, THOMAS LEONIDAS, b. Ky., 1819; son of John J.; a lawyer. He served with distinction on Gen. Taylor's staff and under Gen. Scott in the Mexican war. When Taylor became president, he appointed Crittenden consul at Liverpool. He served in the union army during the late civil war; became brevet maj.gen. of volunteers; retired, 1881; died, 1893.

CRIVELLI, CARLO, Cavaliere, a Venetian painter of the 15th c., said to have studied under Jacobo del Fiore. He introduced agreeable landscape backgrounds, and was particularly fond of giving fruits and flowers as accessories. It was thought that he was of the same family as the painters Donato and Vittorio Crivelli.

CROÄ'TIA, a kingdom forming part of the Austrian empire. Along with Slavonia it forms one of the administrative divisions of the kingdom of Hungary, and their joint pop. was (1890) 2,200,977; their area, 16,773 sq. miles C. lies to the n.e. of the Adriatic, and borders on one side with Turkey. It is traversed by low chains of mountains, in the s. proceeding from the Julian Alps, and in the n. from the Carnic Alps. These mountains are generally covered with forests, and the chains are separated by very fertile valleys. The principal rivers are the Save and its affluent the Culpa, the Drave and its affluent the Mur. Some of the valleys, especially in the s., are quite shut in, so that many of the streams have to make their way through subterranean channels. The climate much resembles that of the neighboring parts of Hungary, the more southern situation being counterbalanced by the greater elevation. The inhabitants are mostly of Slavonic race and language. The religion of C. is that of the Roman and Greek churche The Croatians are warlike, but the name *Croats* is employed to designate light-cavalry regiments in the imperial army, in which Magyars and others are mingled with true Croatians. Grain, chestnuts, wine, and gall-nuts are amongst the principal exports of Croatia. The keeping of cattle is neglected. The wood of the great forests, although much of it is admirably adapted for shipbuilding, is turned as yet to little account. The *Litorale* or coast district contains valuable marble quarries. The capital of C. is Agram (q.v.). C. with its *Litorale* and Slavonia (q.v.) formerly formed a crown-land, at the head of the administration of which was the Ban (q.v.) of Croatia.

C. was, in the earliest historic times, inhabited by the Pannonians, who were conquered by the Romans under Augustus, and the country made a province of Illyria. During the irruptions of the northern nations into the Roman empire, C. suffered a variety of vicissitudes. In 640, the Croats, Chrovats, or Horvats, migrated into it from the Carpathian mountains, and gave it its present name. In the 14th c., having previously been in some measure incorporated with Hungary, C. was more completely united with that kingdom, and passed with it in the beginning of the 16th c. to the Austrian house of Hapsburg. In the end of the 16th c., the Turks conquered a portion of it, now known as Turkish Croatia. The city of Fiume was declared in 1797 to be a constituent and integral part of the kingdom of Hungary; and after the termination of the French wars, Fiume remained united to Hungary till 1848. The Croatians long entertained a feeling of hostility to the Magyars, which manifested itself in 1848 and 1849 in a manner very unfavorable to the cause of the Hungarian revolution. The wise policy of Austria, however, in recognizing the legal rights of the kingdom of Hungary, has had a good effect in allaying this feeling. See MILITARY FRONTIER.

CROCHET (a French word signifying a hook), a species of handiwork, which may be described as an extensive system of looping by means of hooks made for the purpose. You take a hook of a size proportioned to the fineness of the cotton or wool employed, and begin by making a chain of loops. You then turn, and with your hook still in the last loop, begin the double process of catching the thread through each loop of the chain, and also through that in which your hook is, and thus form another chain attached to the first, and so on. This is called simple or plain crochet. Endless varieties of patterns may be formed, and lightness and elegance attained, by twisting the thread one or more times in taking up the loop, and open work is formed by passing one or more loops. This work may be made round by beginning with a very few loops, joining the first to the last, and then proceeding to take several loops through one, and so widening on. C. has this advantage over knitting, that by drawing the last loop, and leaving it wide, there is no fear of the work running down as happens when knitting-needles slip. Shades of the same color, and varieties of colors in wool as well as in silk, are used for this work. In white cotton C. can be made available, from large bed-quilts to delicate lace-like edgings.

CROCKETT, a co. in w. Tennessee formed since 1870. It is in a cotton-growing region. The Louisville and Nashville railroad passes through. Co. seat, Alamo. Pop. '90, 15,146. Area, 260 sq. m.

CROCKETT, a co. in Texas; 3332 sq. m.; formed in 1875; organized in 1891; watered by Pecos and Devil rivers; principal industry, cattle and sheep-raising; pop. '90, 978. Co. seat, Ozona.

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CROCKETT, DAVID, 1786–1836; a native of Ky., famous for eccentricities. He was a good specimen of the unlearned backwoodsman, was a great hunter, and possessed a rare fund of humor, mingled with common sense. He served under Jackson in the war against the Creek Indians. In 1827, and twice afterwards, he was elected to congress, where his oddities of dress and address made much sensation. But refined civilization was irksome to him, and he was among the first of Americans to strike for the independence of Texas. He was one of the defenders of the Alamo, where, with half a dozen others, he was butchered by Santa Anna after the surrender. Crockett's well-known axiom was: "Be sure you are right, then go ahead!"

CROCKETT, SAMUEL RUTHERFORD, author, was b. at Little Duchrae, Scotland, in 1859. In 1876 he entered Edinburgh University, and a few years later went abroad, travelling in Europe, North Africa, and Asia. In 1885 he wrote verses for various Scottish papers, which were collected in a volume entitled *Dulce Cor*, by "Ford Bereton" (1886). Immediately after completing his theological course he went to Penicuik in 1886, where he was Free Church minister until the close of 1894, when he resigned his charge to devote himself to literature. His other books are *The Stickit Minister and Some Common Men* (1893); *The Raiders* (1894); *Mad Sir Uchtred of the Hills* (1894); *The Lilac Sunbonnet* (1894); *The Play-Actress* (1894); *Bog-Myrtle and Peat* (1895); *Cleg Kelly* and *The Grey Man of Auchendrayne* (1896); *Maria Perrone* and *Lad's Love* (1897), etc.

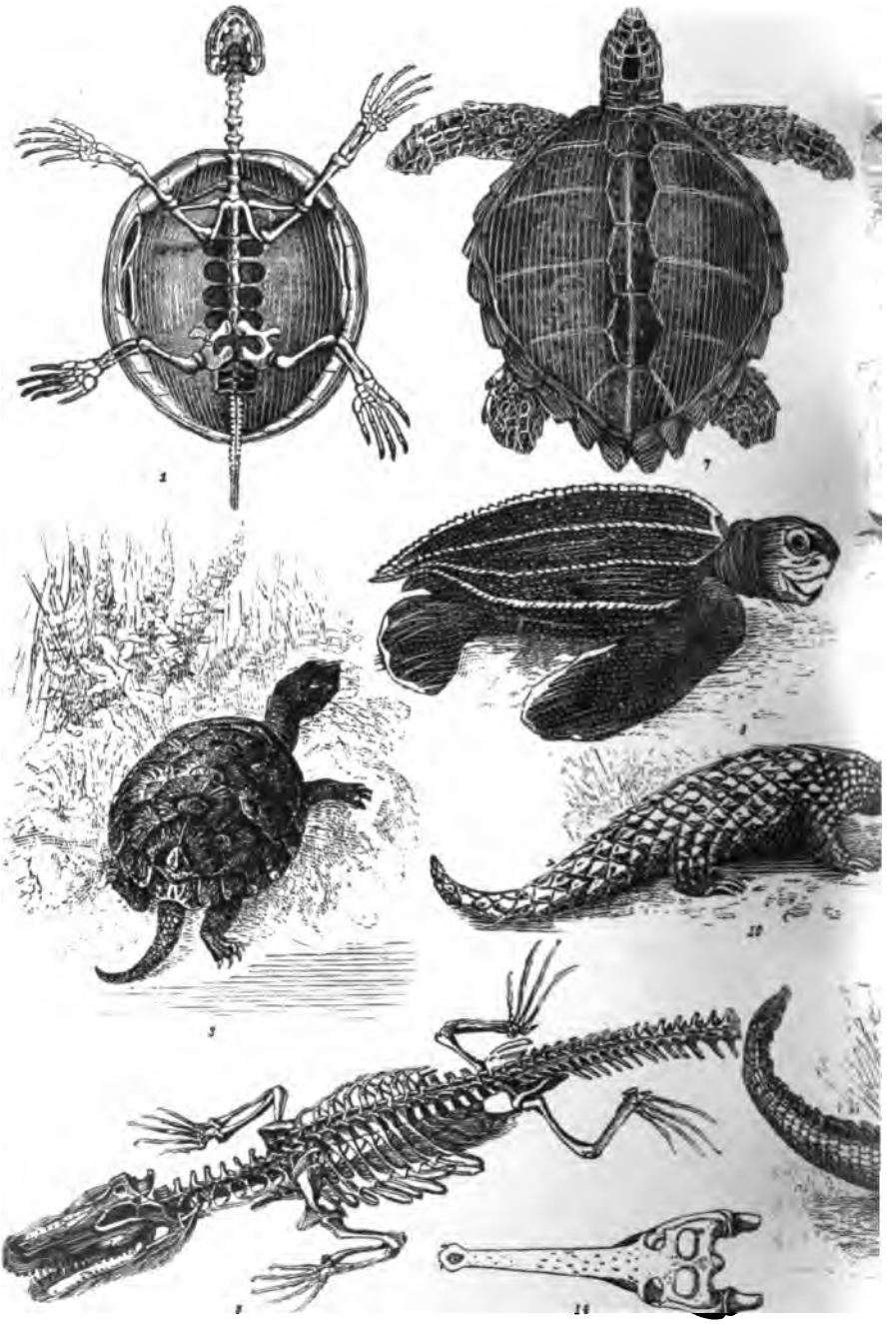
CROCODILE, *Crocodilus*, a genus of saurian reptiles, the type of the family *crocodilidæ;* which some naturalists have erected into a distinct order of reptiles (*loricata*), on account of the square bony plates with which their bodies are covered, instead of the scales of the other saurians—the greater solidity of the skull—the lungs not descending into the abdomen—and the approach which they make to mammalia and birds in the structure of the heart. The heart has two auricles and two ventricles; but a mixture of arterial and venous blood takes place at some distance from the heart, so that the hinder part of the body receives an imperfectly aërated blood, which, however, is supposed to be further aërated in the surface of the peritoneum, two curious openings admitting the water, in which these animals ordinarily live, into the internal cavity of the abdomen. The *crocodilidæ* may be described as lizard-like in form, with a great gape, indicative of their characteristic voracity, and with the tail flattened at the sides, so as to become a powerful organ of propulsion in water. The fore-feet have five toes, the hind-feet four, the three inner ones only being armed with claws: the feet are more or less webbed. Each jaw has a single row of numerous large teeth, which are conical and directed backwards; planted in distinct sockets, and becoming hollowed at the base, to admit the crowns of the new and larger teeth which are to succeed them as the animal increases in size. Small ribs are attached to the vertebræ of the neck, which give it a peculiar stiffness, and make it difficult for the animal to turn; and persons pursued by crocodiles may therefore make their escape by rapid turning. The eggs of the *crocodilidæ* are hard, and small in comparison with the size ultimately attained by the animal itself. The females of some, if not of all the species, guard their eggs, and take care of their young; although the eggs, buried in the sand or mud, are hatched by the heat of the sun alone. The *crocodilidæ* swallow stones, apparently to assist digestion. They prey on fishes and warm-blooded animals; most of them seem to prefer food in a state of incipient putrefaction, and they are even said to hide their prey, and to return to it when it has reached this state. Some of the larger kinds do not scruple to attack man.—All the *crocodilidæ* are large reptiles; they are found in fresh waters and estuaries in the warm parts of the world; none are found in Europe, nor, as far as is yet known, in Australia. They are divided into gavials, crocodiles, and alligators (the latter including caymans).—The true crocodiles are found both in the old world and the new. The muzzle is not slender and elongated, as in the gavials, but oblong and flattened; the teeth are very unequal in size, the long fourth teeth of the lower jaw fitting into *notches* of the upper, not into pits, as in alligators. To this genus belongs the C. of the Nile (*C. vulgaris*), which abounds also in many other rivers of Africa. It is of a bronzed green color, speckled with brown, lighter beneath, and is sometimes 30 ft. long. It often seizes human beings for its prey. The ancient Egyptians held it sacred, and being exempted from all danger on the part of man, it became more bold and troublesome. The DOUBLE-CRESTED or INDIAN C. (*C. biporcatus*), is very abundant in many parts of Asia, in rivers and estuaries, and is also dangerous to man. The smaller marsh C. (*C. palustris*), abundant in stagnant waters in the same regions, flees from man, and often seeks to hide itself in the mud, into which it thrusts at least its snout, then remaining contented, as if in perfect safety. Crocodiles often bury themselves in the mud in droughts, and so abide till rain falls.—The names C. and alligator are often indiscriminately used in popular language. See accompanying illus.

CROCODILE TEARS, hypocritical, forced expressions of grief. This use of the term has sprung from the fiction of old travelers, that crocodiles shed tears over their prey. The conceit of *crocodiles' tears* (the animals have large lachrymal glands) was common in Shakespeare's time, and Spenser (*Faerie Queene*, I., v. 18) describes them.

CRO'CUS, a genus of plants of the natural order *iridaceæ*. The species have much general similarity, and are natives chiefly of the s. of Europe and of the east. Several have been described as British, but are rather naturalized than native. Saffron (q.v.) is the produce of *C. sativus*. Some of the species are much cultivated in gardens for the

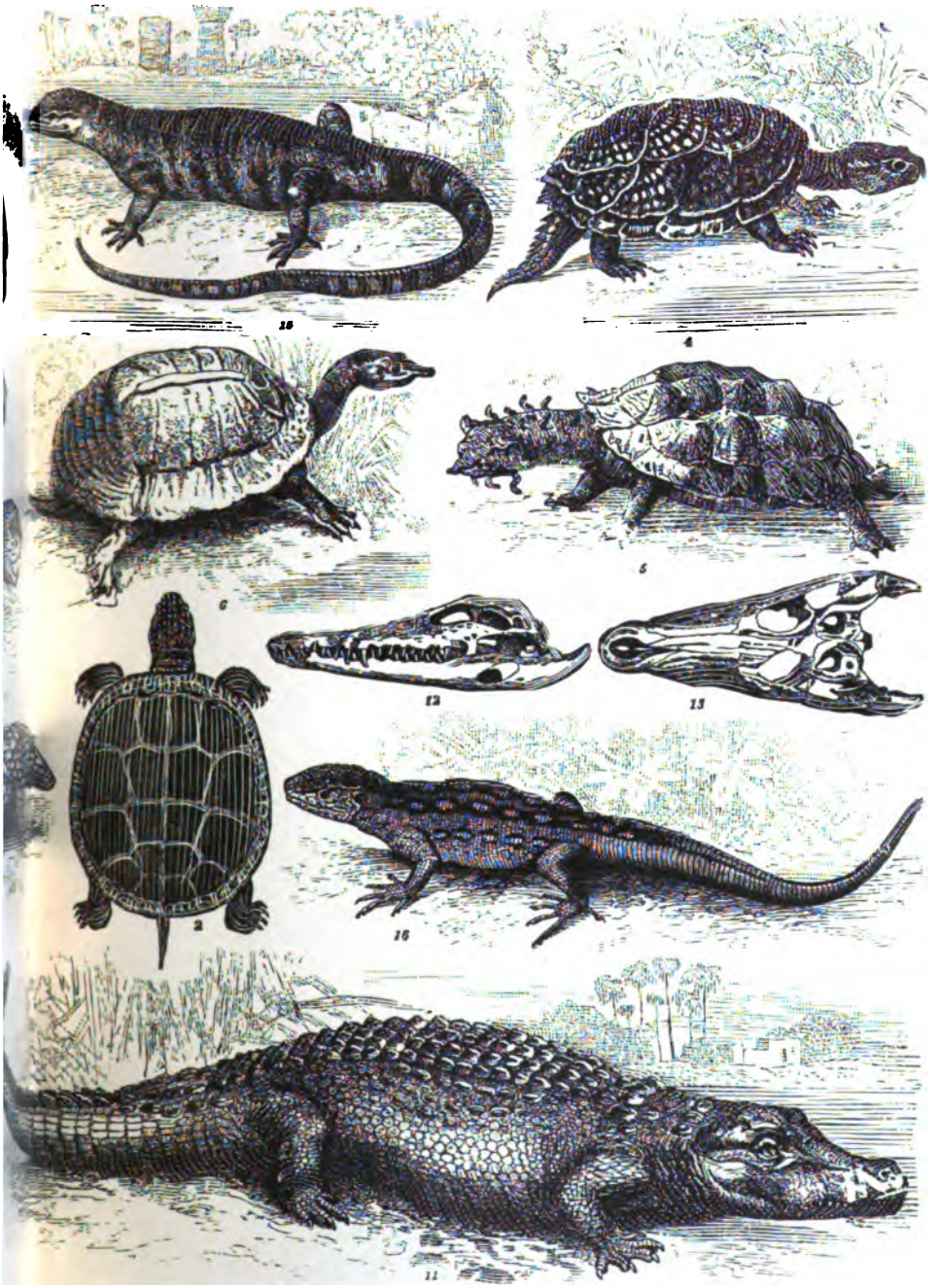
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Crocodiles, etc.—1. Skeleton of turtle. 2. Land-turtle. 3. Swamp-turtle. 4. Snapping turtle. 9. Skeleton of crocodile. 10. Manis or scaly lizard. 11. Nile crocodile. 15. Egyptian-lizard. 16. Hedge-lizard.

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-turtle. 5. Fringed tortoise. 6. Biting-turtle (Trionyx ferox). 7. Caouana. 8. Leathery-
12. Profile of crocodile's skull. 13. The same, from above. 14. Skull of gavial, from above.

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beauty of their flowers, particularly those which, as *C. vernus* and *C. luteus*, flower very early in spring. The saffron C. and some other species flower in autumn. The flowers of one or two species are fragrant. It is necessary frequently to take up C. roots and plant anew, on account of the manner in which the corms multiply. See CORM. See illus., BOTANY, vol. II.

CROCUS OF ANTIMONY is the oxysulphide of antimony (q.v.).

CROCUS OF MARS is the finely divided red oxide of iron.

CRŒSUS, the last king of Lydia, succeeded his father, Alyattes, in 560 B.C. He made the Greeks of Asia Minor his tributaries, and extended his kingdom eastward to the Halys. From his conquests, his mines, and the golden sand of the Pactolus, he accumulated so much treasure, that his wealth has become proverbial. He gave himself up to a life of pleasure and sumptuous extravagance, and is said to have deemed himself the happiest man in the world, and to have been displeased when Solon, on a visit to his court, told him that no man should be called happy till his death. He soon found how uncertain was a happiness such as his; for his beloved son Atys was killed while hunting, and there was left to him only one son, who was dumb; and having engaged in war with Cyrus, he was totally defeated, his kingdom conquered, and himself made prisoner, and condemned to be burnt (546). At the funeral pyre, his repeated exclamation of "O Solon!" drew on him the attention of the conqueror, and the reason of it being known, his life was spared, and he was treated with great kindness. Cyrus gave him for a residence the city of Barene, near Ecbatana, and is said to have consulted him in his military undertakings, a statement which, if true, indicates that C. by no means lacked native ability. Herodotus informs us that he accompanied Cambyses, the son of Cyrus, to Egypt, and while there, incurred great danger by the boldness with which he condemned, on one occasion, the cruel conduct of the Persian king.

CROFFUT, WILLIAM AUGUSTUS, PH. D., b. Redding, Conn., 1836; educated at a private school in Wilbraham, Mass.; during the civil war was first a soldier and then a correspondent in the field for the *New York Tribune;* afterward became editorially connected with various journals, and editor of the bureau of the U. S. geological survey. He is the author of *The War History of Connecticut*, *A Helping Hand for American Homes*, and *A Midsummer Lark*, a humorous and descriptive poem, and of the poem read at the opening of the Columbian World's Exposition in 1893.

CROFT (Ang. Sax. *croft*), a piece of land connected with a humble kind of dwelling, whose inhabitant, the renter of the land, is called a crofter, and this method of letting small pieces of land, either for tillage, or the rearing of cattle, is known as the crofting system. This kind of petty farming was formerly common in Scotland, more particularly in the Highlands. See SPADE-HUSBANDRY.

CROIX, STE. (or SANTA CRUZ), in English, *Holy Cross* or *Holyrood*, or, somewhat barbarously, *St. Cross*, an island, the most southerly and extensive of the Virgin group, is the principal Danish possession in the West Indies. With an area of about 84 sq. m., it contained (1890) 19,783 inhabitants, being generally cultivated like a garden.—St. C. is also the name of a river, otherwise known as the Schoodic, and also as the Passamaquoddy, which falls into Passamaquoddy bay, on the w. side of the entrance of the bay of Fundy. It is the boundary between the state of Maine and the province of New Brunswick, having been so defined, from its mouth to its source, by the international treaty which recognized the independence of the United States. The St. C. is about 75 m. long, its lowest 12 m. being navigable for large vessels.

CROIZETTE, SOPHIE, b. St. Petersburg, Russia, 1847, of Slav and French parents. She was educated for a governess, but, failing to obtain pupils, was induced to try the stage. At the Conservatoire, 1868, she carried off the first prize. She made her début at the Comédie Française, 1870, but made no very decided hit until 1874, when her acting as the heroine of Feuillet's *Sphinx*, especially in the death-scene, caused a great sensation. She left the stage in 1881, and was married in 1885.

CROKER, JOHN WILSON, an English politician and *littérateur* of considerable notoriety, was b. at Galway, in Ireland, Dec. 20, 1780. Having been educated at a school in Cork, and at Trinity college, Dublin, he entered Lincoln's inn as a law-student in 1800, and was called to the Irish bar two years afterwards. His first literary attempt was a satire on the Irish stage, which exhibited much caustic cleverness. This was in 1803; and in 1805, he published another equally clever satire on the city of Dublin, entitled *An Intercepted Letter from Canton*. Both productions proved a great success, running through several editions. In 1807, he issued a treatise on the *State of Ireland, Past and Present*, which brought him into some notice, and, in the same year, he was elected member of parliament for Downpatrick. A warm defense in parliament, in 1809, of the duke of York, charged with corrupt administration at the horse guards, helped C. in the same year to the office of secretary to the admiralty, a post which he held for 20 years. He was one of the founders of the *Quarterly Review*, and contributed many of the most violent party articles to its pages, as well as a large number of those bitterly personal and grossly abusive reviews which were wont to disfigure that periodical. As "Rigby," allowance being made for the satire, his character is not badly hit off by Disraeli, in *Coningsby*. In parliament, C. steadily opposed the reform bill in all its stages, and its enactment ended his parliamentary career; but on all questions relative to the promotion of the fine arts, he was much ahead of the great majority of the com-

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mons. He took an active part in the establishment of the Athenæum club, and rendered good service to literature by his annotated edition of Boswell's *Johnson*, and his publication of the *Suffolk Papers*, and lord Hervey's *Memoirs of the Court of George II.* His *Stories from the History of England for Children*, supplied Scott with the idea of *Tales of a Grandfather*. C. died Aug., 1857.

CROKER, THOMAS CROFTON, a popular author and collector of Irish stories and legends, was b. in Cork, Jan. 15, 1798. He early devoted himself to the collection of legends and songs of the Irish peasantry; and in 1824 he published his *Researches in the South of Ireland*, characterized by a happy blending of humor and sentiment, with archæological learning. The work was followed by the *Fairy Legends and Traditions of the South of Ireland* (1825); *Legends of the Lakes* (1828); *Daniel O'Rourke*, a sort of Irish Münchhausen (1828); *Barney Mahoney* and *My Village* (1832); and *Popular Songs of Ireland* (1839). Of all these works, *Barney Mahoney* and *My Village* are the most original; the others partly consist of compilations; but all are marked by sound knowledge of their subjects, and a *con amore* style of writing. C. also edited *Memoirs of Joseph Holt, General of the Irish Rebels*, a very interesting work, which was published in 1838. He devoted much time, and rendered considerable service, to archæology, being member of many antiquarian societies. Through the influence of John Wilson Croker, a friend, but no relative, he at the age of 21 obtained a clerkship in the admiralty, where he rapidly rose, until he had £800 per annum. He retired from the admiralty in 1850, with a pension of £580, and died Aug. 8, 1854.

CROLY, Rev. Dr. GEORGE, an English poet, romance-writer, and preacher, of considerable reputation, was b. at Dublin, about 1785, and educated at Trinity college there. He entered the English church, and ultimately became rector of St. Stephen's, Walbrook, London. His first work was a poem, entitled *Paris in* 1815. From this time up to within a short period of his death, which took place Nov. 24, 1860, his pen was almost incessantly at work—on satire, comedy, tragedy, romance, tales, biography, magazine articles, and the weightier matters of religion. Few subjects came amiss to him, and he exhibited considerable talent in the treatment of most that he touched upon. His best known work is the romance of *Salathiel*. C. was also famous for his eloquence as a pulpit orator.

CROLY, JANE CUNNINGHAM (pen name, JENNIE JUNE), author; b. in England, 1831; came to the United States in girlhood; married David G. Croly, 1856; became a contributor to several influential newspapers and magazines; called the first congress of women in the United States, 1856; organized the Sorosis, 1868; founded the New York women's press club, 1889; and became professor of journalism and literature in Rutgers women's college, 1892.

CRO'MARTY, a parliamentary burgh and seaport in the united counties of Ross and Cromarty, on a low peninsula between the Moray and Cromarty firths, on the s. side of the entrance into the latter, and 21 m. n. of Norwich. Pop. '91, 1308. It has manufactures of ropes, sacking, sailcloth, beer. The chief industry is the herring and white fisheries.

CROMARTY FIRTH, a landlocked inlet of the North sea, on the n.e. coast of Scotland, just n.w. of the Moray firth, and inclosed by parts of the counties of Cromarty and Ross. It forms a noble harbor 18 m. long, running s.w., 3 to 5 m. broad, and 5 to 35 fathoms deep. It receives several rivers, the Conan, entering at its upper end, being 35 m. long. The entrance to C. F. is by a strait between two high wooded cliffs or headlands, the North and South Sutors of Cromarty, only 1¼ m. across, with 12 to 30 fathoms of water, and with the Three Kings reef about half a mile off land. Near the firth are the towns of Dingwall, Invergordon, and Cromarty. The largest fleet could ride safely sheltered in this fine sheet of water. In the old red sandstone, near the mouth of the firth, Hugh Miller discovered the fossil fishes *pterichthys*, *osteolepis*, etc.

CRO'MARTYSHIRE, a co. of the n. of Scotland, intimately connected, geographically and politically, with Ross-shire, and consisting of 19 detached portions in the interior, and along the northern borders of Ross-shire, with which it joins in sending a member to Parliament. See ROSS AND CROMARTY.

CROMDALE, a village on the e. bank of the Spey, Inverness-shire, at which was fought the battle of C., May 1, 1690, between a small remnant of the adherents of the house of Stuart, who kept in arms after the death of viscount Dundee, and the forces of king William, in which the latter were victorious. This encounter has been rendered famous by a song, entitled *The Haughs of Cromdale*, which, however, presents a lamentable confusion of historical events.

CROME, JOHN, 1769–1821; an English landscape painter, son of a weaver. He was apprenticed to a sign painter, and after long effort became a teacher of drawing. His works represent the familiar scenery of his native country.

CRO'MER, a seaport and wateringplace on the n. coast of Norfolk, 21 m. n. of Norfolk. It stands on the top of one of the highest cliffs of the coast. Nearly all the old town, called Shipden, with one of the churches, was swept away by the sea about the year 1500. The sea is gaining on the land, and vessels have to load and unload on the open beach. In 1825, some cliffs, 200 ft. high, fell into the sea. Seamen call C. bay the

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Devil's Throat, from its dangers to navigation. C. has fisheries for crabs, lobsters, herrings, and mackerel. Pop. '91, under 2500.

CROMER, EVELYN BARING, LORD, English diplomatist; b. Feb. 26, 1841; was private secretary to the governor-general of India, 1872–76; commissioner on the public debt, 1876–79; controller-general of Egyptian finances, 1879–80; finance minister of India, 1880–83; and consul-general and minister in Egypt since 1883. He was created first lord Cromer in 1892; received the degree of D.C.L. from Oxford in 1898; and became known as the "maker of modern Egypt."

CROMLECH. It has been common among British archæologists, until lately, to apply this name to a rude structure of two or more unhewn stones, placed erect in the earth, and supporting a larger stone, also unhewn. According to its etymology, however, cromlech (Celt. *crom*, circle, and *lech*, a stone) is the proper term for circles of erect stones like Stonehenge (see STANDING STONES); and the name *dolmen* (Celt. *daul*, a table; *maen*, a stone) is now considered more appropriate for what used to be called a cromlech. Monuments of the kind above described, whether we call them dolmens or cromlechs, are known among the common people by other names, such as "the giant's grave," "the giant's bed," "the giant's quoit," "the fairies' table," "the devil's table," "the raised stone," "the old wives' lift," "the hag's bed," and the like.

Cromlechs are found in England, Wales, Scotland, Ireland, the Channel isles, France, Spain, Germany, Denmark, and some other countries of Europe; in Hindustan and elsewhere in Asia; and in America. They are generally without any inclosure; but occasionally they are fenced round with a ring of unhewn stones. In a good many instances, cromlechs have been discovered in the heart of earthen mounds or barrows. In such cases, the rude chamber or inclosure of the C. is found to contain sepulchral remains, such as skeletons or urns, together with weapons or ornaments generally of stone or bone, fragments of pottery, and bones of animals. Similar remains have been found in the chambers of cromlechs not known to have been at any time covered by barrows. These facts have led modern archæologists to believe that the C. was a sepulchral monument. The theory of the older antiquaries, that the C. was a Druidical altar, is without any foundation in what has been recorded of the Druidical worship by trustworthy writers. In a C. found under a barrow in Derbyshire, a skeleton and fragments of urns were discovered, along with Roman coins of several emperors.

Among the more remarkable cromlechs in England are Kit's Coty house in Kent, Wayland Smith's cave in Berkshire (commemorated by sir Walter Scott in *Kenilworth*), and Chun Quoit in Cornwall. The weight of the flat stone in this last C. is estimated at about 20 tons. In the marquis of Anglesey's park at Plas Newydd, in Wales, there are two cromlechs close beside each other: in the larger, five erect stones support a flat stone about 12 ft. long, 10 ft. wide, and from 3½ ft. to 4½ ft. thick. Cromlechs are comparatively rare in Scotland. The best among the well-ascertained examples is perhaps that called "The Auld Wives' Lift," near Craigmeddan castle, in the parish of Balderock, in Stirlingshire: the recumbent stone, a mass of basalt, is 18 ft. long, 11 ft. wide, and 6 or 7 ft. thick, and the two stones which support it are of nearly the same size. It may be doubted if the partial elevation of the "Witch's stone" at Bonnington Mains, near Ratho, in the co. of Edinburgh, has not been produced by natural causes. Among the Irish cromlechs, one of the most striking is that of Kilternan, about 6 m. from Dublin: the recumbent stone, which rests upon six blocks, is 23½ ft. long, 17 ft. wide, and 6½ ft. thick. A cromlech called "The Broadstone," in the co. of Antrim, is surrounded by a circle of standing stones, or erect unhewn pillars. A C. in the Phœnix park, Dublin, was discovered in 1838 in removing a large barrow: specimens of the sepulchral remains found in it are shown in the museum of the royal Irish academy. See DOLMEN.

CROMPTON, SAMUEL, whose invention of the spinning-mule entitles him to rank as one of mankind's greatest benefactors, was b. at Firwood, Bolton, Lancashire, Dec. 8, 1753. Bolton, in those days, was nearly inaccessible, and so bleak and barren that agriculture was not followed further than to supply the wants of the population. All the farmers had looms in their houses, and their families were occupied in spinning and weaving. C.'s father, who was a small farmer, lived at the Hall-in-th'-Wood, a picturesque old mansion near Bolton. He died at an early age, leaving a wife, and a son (the subject of our memoir), and two daughters. Like his father, C. was brought up to the loom and the farm. His mother, a woman of great energy, perseverance, and stern independence, struggled hard to give him and her daughters the best education the district afforded. When he was old enough, he assisted her in the farm, and wove; going to Bolton at night to complete his education in mathematics, etc. At the age of 21, he was so much annoyed at the difficulties in getting yarn to weave, that he set to work to invent a spinning-machine which should produce better yarn than Hargreaves', one of which his mother possessed. For five years he labored to realize his idea, sitting up late at night to overcome the successive difficulties, and resuming his labor for daily bread early in the morning. At length he succeeded in framing a machine which produced yarn of such astonishing fineness, that the house was beset by persons eager to know how such wonderful and desirable yarn could be made. He was rendered miserable. All kinds of devices were tried to gain admission; even ladders were placed

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against his windows. His machine was such that if a mechanic saw it, he could carry away the leading features of it. He could not leave the house for fear of his discovery being stolen from him. He had spent every farthing he had in the world upon its completion; he had no funds wherewith to have obtained a patent, and it is doubtful whether a patent would have altered his fate. When he was thus almost driven to desperation, one of the manufacturers went to him and persuaded him to disclose the invention to the trade, under the promise of a liberal subscription. Inexperienced in the world, he agreed to this. The machine was exhibited, but all that he got was about £60. This money was not paid to him at the time, but he had to travel for many miles round the country to collect it. Some refused to pay, though he showed them their signatures. He set manfully to work with his machine, determined to make the best he could of his ill-luck. In the course of time, he saved money enough to begin manufacturing on a small scale, but not till his rivals had nearly 20 years' start of him in the business. Then his wife died, leaving him a large family. Efforts were made to obtain for him a national reward. Five thousand pounds was all he obtained, and he returned to Bolton almost broken-hearted. Misfortune upon misfortune overtook him till he died, June 26, 1827. Some idea may be formed of the vast services he has rendered to the world, and especially to his native land, by the fact that his is by far the most used of all spinning-machines. In 1811, the number of spindles on C.'s principle was 4,600,000, while there were only 310,500 of Arkwright's, and 155,880 of Hargreaves'. The number of Crompton's spindles increased to an enormous extent in subsequent years. Yet this great genius was never noticed by his king, and the appointments under the factory acts to which his descendants might have aspired, have been filled by the relatives or nominees of her majesty's ministers. For a complete account of this great improver of the cotton manufacture, we refer to the *Life of Crompton*, by Mr. G. French, 1880.

CROMWELL, Henry, 1628–73; second son of the great protector, and, at the age of 16, a soldier in the parliamentary army. In the Barebone parliament he sat as one of the six Irish members. In 1655, he was sent to Ireland as a maj.gen., and was subsequently made lord-deputy. His latter years were passed as a farmer. His great-grandson, the last representative of the house of Cromwell, died in 1821.

CROMWELL, Oliver, was born at Huntingdon, April 25, 1599. His father was the younger son of sir Henry Cromwell of Hinchinbrook, and a substantial country gentleman, not likely to have been a brewer, as some of Oliver's earlier biographers assert. By his mother, genealogists trace Oliver's descent from the royal house of Stuart. Of the boy Cromwell's early life, little or nothing is actually known. What is clearly ascertained is that, after having been at school in Huntingdon, he went to Cambridge, and entered himself of Sidney-Sussex college, April 23, 1616. He had but short time for study here, his father dying in the June of the year following, when he returned home to take the management of his father's affairs. The stories of his wild life about this time appear to have no better foundation than the calumnies of royalists. In Aug., 1620, C. married the daughter of sir James Bourchier, a gentleman of landed property in Essex, who had also a residence in London. This fact is pretty conclusive as to C.'s social position being much above what his enemies have described it. C. now became intimately associated with the Puritan party, among whom he was soon distinguished alike for his earnestness and sagacity. In 1628, having been elected by the borough of Huntingdon, C. made his first appearance in parliament. He had but time to make a short blunt speech about the encouragement of the "preaching of flat popery at Paul's Cross" by the bishop of Winchester, when the infatuated king unceremoniously dispatched him and his fellow-commoners to their homes. C. returned to the fen-country, not much impressed in favor of kingcraft by his visit to London; and for the next eleven years devoted himself assiduously to the pursuit of farming by the Black Ouse river and the Cam, first at Huntingdon, then at St. Ives, and finally at Ely—making himself famous, not by political agitation, but by an effectual resistance to certain unjust schemes of the king in council for the drainage of the fens. In 1640, he was sent to parliament as member for the town of Cambridge. His appearance at this time was by no means prepossessing. Sir Philip Warwick describes him in "a plain cloth suit, which seemed to have been made by an ill country tailor; his linen was plain, and not very clean; and I remember a speck or two of blood upon his little band, which was not much larger than his collar. His hat was without a hat-band; his stature was of a good size; his sword stuck close to his side; his countenance swollen and reddish; his voice sharp and untunable; and his eloquence full of fervor;" and courtly sir Philip adds: "It lessened much my reverence unto that great council, for this gentleman was very much hearkened unto." When all hope of reconciliation between king and parliament failed, through the perfidy of the former, C. was among the first to offer of his substance to aid in defense of the state. In July, 1642, he moved in parliament for permission to raise two companies of volunteers in Cambridge, having been careful to supply the necessary arms beforehand at his own cost. In the following month, C. seized the magazine in Cambridgeshire, and prevented the royalists from carrying off the plate (valued at £20,000) in the university there. As captain of a troop of horse, C. exhibited astonishing military genius; and against the men trained by himself—"Cromwell's

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Ironsides"—the battle-shock of the fiery Rupert, which at the beginning of the parliamentary struggle none else could withstand, spent itself in vain. Soon promoted to the rank of col., and then to that of lieut.gen., C., in the fight of Winceby, on the bloody field of Marston (July 2, 1644), and in the second battle of Newbury (Oct. 27, 1644), bore himself with distinguished bravery; but, owing to the backwardness of his superiors, the results of these victories to the parliamentary cause were not so great as they might reasonably have been. C. thus complained in parliament of the backwardness of his superiors, Essex and Manchester: "I do conceive if the army be not put into another method, and the war more vigorously prosecuted, the people can bear the war no longer, and will enforce you to a dishonorable peace." Hereupon, the "self-denying ordinance"—an act excluding members of the houses of parliament from holding command in the army—was passed; but C.'s services were considered of such importance to the common weal, that they were exceptionally retained. Of the new model army, Fairfax was appointed gen., C. serving under him as lieut.gen. of the horse, and in this capacity he commanded the right wing of the parliamentary army at Naseby, June, 1645, and acquitted himself so well there, that the king's forces were utterly ruined. The royalists in the west were now speedily reduced. Bristol was stormed; everywhere the royal cause was failing; and Charles himself, reduced to the last extremity, in May, 1646, escaped from Oxford in disguise, and threw himself into the arms of the Scotch army at Newark (May 5, 1646), by whom he was shortly given up to the parliamentary commissioners. The source of the strife now fairly within their grasp, the parliament and the army, in the former of which the Presbyterian, and in the latter the Independent, element predominated, became jealous of each other's power. With his usual sagacity, C. perceived that the advantage would lie with that party who held possession of the king's person, and with ready decision he had him removed from the hands of the commissioners into those of the army, June, 1647. Some of the leading Presbyterians were now turned out of parliament by the army, and Independency, with C. at its head, was gradually obtaining the ascendency. The king still remained with the army, and with his usual duplicity, negotiated with both parties, not without hope that out of their mutual dissensions might arise advantage to himself. On the 11th Nov., 1647, the king made his escape from Hampton court. Two days after, he was in custody of Col. Hammond in the isle of Wight. At this time the country was in a critical condition. The Welsh had risen in insurrection, a Scotch army was bearing down from the n. with hostile intent, and Rupert, to whom seventeen English ships had deserted, was threatening a descent from Holland, not to speak of the rampant royalism of Ireland. Prompt measures alone could prevent anarchy and inextricable confusion, and C. was not afraid to employ them. Pembroke had to surrender, and at Preston Moor the Scotch were utterly defeated. On the return of the army to London, the Presbyterians, who were still blindly temporizing with the king, to the number of more than 100, were driven out (Dec., 1648), by the process known in history as "Pride's purge." Then that which C. thought could alone end the strife, happened In Jan., 1649, the king was tried, condemned, and executed. The abolition of the house of lords followed speedily, and C. became a prominent member of the new council of state; and in the army, though still only lieut.gen., he had really much more influence than the commander-in-chief The royalists being still strong and rebellious in Ireland, C. went thither in Aug., with the title of lord-lieutenant, and commander-in-chief of the army there; and ere nine months had passed, he had subdued the country so far, that it might be safely left to the keeping of his son-in-law, Ireton. C.'s measures for crushing the Irish rebels were indeed severe, and even sanguinary, but, nevertheless, peace and prosperity followed in a degree unknown before in the history of that unhappy country. Affairs in Scotland now claimed C.'s attention. Scotch commissioners had been negotiating with Charles II. at Breda, had urged him to come among them and take the covenant, and they would crown him king over them at least, and do what force of arms could do to make him king of England also. Charles arrived in the n. of Scotland on the 23d June, 1650; three days thereafter, Cromwell—Presbyterian Fairfax having refused to fight against the Presbyterian Scotch—was appointed commander-in-chief of all the parliament forces. On the 15th of July, Charles Stuart had signed the covenant, and was fully accepted ed as king. On the 3d Sept. following, C. routed the Scotch army at Dunbar. Charles, with what force remained, and other accessions, afterwards marched southward, and had penetrated to Worcester, when C. came up with him, and utterly overthrew the royalists on the anniversary of the battle of Dunbar. This battle placed C. avowedly at the head of public affairs in England, and to write his biography from this time until his death, would be to write the history of the commonwealth. The Long parliament had now degenerated into the Rump—had become, in truth, an oligarchy, given to long and useless discussions about mere technicalities—intolerable to the country alike for the extraordinary power it possessed, and for the weak, pusillanimous way in which it exercised it. C., therefore, dissolved the Rump, 20th April, 1653, and henceforth he alone was ruler in England. He immediately summoned a parliament of 140 persons, 138 of whom assembled on the 4th July, but he found it necessary to dissolve it on the 12th Dec.; its one great work having been the legal investiture of C. with the supreme power and the title of lord protector, a position upon which the principal foreign powers

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hastened to congratulate him. C. now acted in a very arbitrary manner, so far as his parliaments were concerned, calling them and dismissing them at pleasure; but his home policy, notwithstanding, was just and liberal towards the mass of the people, and conducive to the prosperity of the country; while his foreign policy was such as to secure England a position among nations more commanding than any she had ever occupied before. Under C.'s rule, swift retribution followed any indignity or injury to Englishmen, no matter by whom or where perpetrated; and religious persecutors on the continent, in terror, stayed their bloody swords on the stern summons of the lord protector. He died Sept. 3, 1658, the anniversary of some of his most important victories. C. was buried in Westminster abbey; but on the 30th Jan., 1661 (the anniversary of the death of Charles I.), his grave, along with those of Ireton and Bradshaw, were broken open, the coffins dragged to Tyburn, where the moldering bodies were hanged, and then thrown into a deep hole under the gallows, while their heads were set upon poles on the top of Westminster hall. Such was the sacrilegious brutality of the king and clergy (for the deed was done by their authority) towards England's greatest ruler. It was long a fashion with historians, content to rely upon the calumnies and falsehoods of royalist writers, to represent C. as a monster of cruelty and hypocrisy—a man with a natural taste for blood, who made use of religious phraseology merely to subserve his own ambitious ends; but after the researches of Carlyle and Guizot, the eloquence of Macaulay, and the clear statement and sound sense of Forster, such a view can no longer be upheld. C.'s religion was no mere profession, it was the very essence of the man; by nature, he was not a blood-shedder, and when necessity demanded the grim exercise of the sword, he unsheathed it with reluctance. Never was a religious man less of a bigot; he would not, in so far as his iron will could effect his purpose, permit any one to be persecuted for religious opinions. He delivered Biddle, the founder of English Unitarianism, out of the hands of the Westminster divines. He would have even given the despised and persecuted Jews the right hand of citizenship. He made England feared and respected by foreign nations, and did much to establish her great maritime power. See S. R. Gardiner, *Cromwell's Place in History* (1897).

CROMWELL, RICHARD, son of Oliver Cromwell, lord protector of England, was b. at Huntingdon, Oct. 4, 1626. In early life, he was noted chiefly for his indolence and love of pleasure, qualities that united him more closely to the cavaliers than to the party of earnest men of which his father was the chief. When Oliver attained the dignity of lord protector, he called his son from the obscurity of a country-house, and his field-sports, to have him elected for the counties of Monmouth and Southampton, appointed him first lord of trade and navigation, and made him chancellor of Oxford. In none of these capacities did Richard C. exhibit any aptitude; and his failure as protector, to which high office (being the eldest surviving son) he succeeded, on the death of his father, Sept., 1658, was still more conspicuous. With a mediocre intellect, and no energy, hardly a friend in the army, and the first parliament he called against him, the result could not be otherwise than it was—his demission (April, 1659)—little more than seven months after he had assumed the sceptre of the commonwealth. He retired to Hampton Court, from whence parliamentary stinginess and pressing creditors soon drove him to the continent, where he resided for a considerable period. At length, returning to England, he had a house provided for him at Cheshunt, near London, where he resided in strict privacy until his death, in 1712.

CROMWELL, THOMAS, an eminent English statesman and ecclesiastical reformer, of the reign of Henry VIII., was b. near London in very humble circumstances, his father being a blacksmith, about 1490. After receiving but a very meagre education, he went to the continent, and became clerk in a factory at Antwerp, where he devoted his spare time to the acquisition of languages, in which he became very proficient. In 1510, he went to Italy, where he appears to have resided until about 1517, when he returned to England; and, after some time, was received into the household of Wolsey. That prelate, speedily recognizing his abilities, made him his solicitor and chief agent in all important business. As a member of the house of commons, C. warmly and successfully defended the fallen minister, his master, against the bill of impeachment—proof enough that he was not the heartlessly ambitious man that his enemies have represented him. Henry, admiring his chivalry, and appreciating his talent, made him his own secretary; knighted him in 1531, and made him a privy-councillor. Honors rapidly flowed in upon him; partly in consequence, it is said, of his having suggested to Henry the desirableness of throwing off the papal yoke altogether—an idea which suited well with the king's impetuous nature—but chiefly, no doubt, on account of his great abilities. In 1534, he had become chief secretary of state, and master of the rolls; in the following year, he was made visitor-general of English monasteries—which he afterwards suppressed in such fashion as to obtain for himself the designation of *malleus monachorum* —and keeper of the privy seal in 1536. In 1539—to pass over a variety of minor tokens of royal approbation—he had risen to be earl of Essex—having had some thirty monastic manors and estates given to him to keep up the dignity of his title—and lord chamberlain of England. C. took the leading part in establishing the doctrines of the reformation, though he seems to have done so less on religious than on political grounds. The destruction of the pope's authority, and the establishment of the supremacy of the

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king in England, were what he labored to effect; and with this the articles of the new faith, had English bibles placed in the churc... of the nation taught the creed, the ten commandments, and the Lor... ordered the removal of all images from the altar. In this matter of ecclesiast... he has, says Mr. Froude, in the third volume of his *History of England*, "left the p... of his individual genius stamped indelibly, while the metal was at white heat, into the constitution of the country. Wave after wave has rolled over his work. Romanism flowed back over it under Mary; Puritanism, under another even grander, Cromwell, overwhelmed it. But Romanism ebbed again, and Puritanism is dead, and the polity of the church of England remains as it was left by its creator." In all that concerned the state, in its vastest and most complicated foreign relations, as well as in the smallest matters of sanitary reform at home, C. took an active personal interest. But the stern, almost savage manner in which, in the carrying out of his policy, he disposed of all who opposed him, led to many and loud complaints, which damaged somewhat his popularity with the king. In order to retrieve his lost ground, he was zealous in promoting the marriage of Henry with Anne of Cleves, from whom, on account of her known Lutheran tendencies, he expected strong support. The success of his efforts in this matter proved the utter ruin of C., for the king, early conceiving a strong aversion to his unlovely queen, extended that dislike to the minister who had so strenuously promoted the marriage. Complaints against C. poured in thicker and faster, and the royal ear was not unwilling to listen now. Charges of malversation and treason were made, and he was arrested and thrown into prison (10th June, 1540); a bill of attainder was quickly drawn up, and passed the two houses of parliament with little difficulty; and on the 28th July following, C. laid his head on the block on Tower hill. A statesman of undoubted genius, he saw what was best for his country, and did it—not certainly in a way commending itself to the judgment of the present time—but, perhaps, among the best and only sure modes that could be devised in his age. He was undoubtedly unscrupulous, and very haughty towards the high; but the poor and weak found him easily accessible, and, when wronged, a warm defender.

CRONOS, in Greek mythology, a son of Uranus and father of Jupiter, Neptune, Ceres, and Juno. He is usually identified with the Roman Saturn.

CRONSTADT (Hungarian, *Brasso*), a t. of Transylvania, romantically situated amid the East Carpathians, at an elevation of 2,000 ft. above the sea. Lat. 45° 36′ n., long., 25° 33′ east. It consists of an inner town, surrounded by walls, and of three pretty extensive suburbs, the population being (1890) 30,739. The center town, which dates from the 13th c., is well and regularly built, and contains some handsome buildings, the chief of which is a Gothic Protestant church, built in the 14th century. This part is almost exclusively inhabited by Saxons. The suburbs, surrounded with gardens and orchards, with here and there the hoary ruins of some old castle, or the sloping roofs of some modern villa, rising above the trees, have a pleasant and picturesque appearance. The suburbs are chiefly occupied by Wallachs and Magyars. Linens, cottons, coarse woolens, hosiery, paper, etc., are manufactured here in considerable quantities. C. was the first town in Transylvania where a printing-press was established, and the first issues from it were the *Augsburg Confession*, and the works of Luther.

CRONSTADT, a strongly fortified seaport, about 20 m. w. of St. Petersburg, on a narrow calcareous island of about 5 m. in length, at the narrowest part of the Gulf of Finland, and over against the mouth of the Neva. Lat. (of cathedral) 59° 59′ 46″ n., long. 29° 46′ 38″ east. C. is at once the greatest naval station and the most flourishing commercial port of Russia. It was founded by Peter the Great in 1710, the island having been taken from the Swedes by him in 1703. Its fortifications, which protect the approach to St. Petersburg, have been an object of great attention to the Russian government. The batteries are very numerous, defending every part of the channel by which vessels can enter. They are built of granite, and armed with the heaviest ordnance. The place, indeed, was considered by the British admiral who reconnoitered it during the Russian war of 1854–55, so impregnable that it would have been utter madness to make any attempt upon it. C., which is the seat of the Russian admiralty, has three harbors: the east, intended for vessels of war, and capable of accommodating 80 ships of the line; the middle harbor, where vessels are fitted up and repaired, and which is connected with the former by a broad canal; and the west or merchant's harbor, for the merchant shipping, with capacity for 1000 vessels; all are admirably defended. Not only the trade of St. Petersburg is conducted through this port, but that of a great part of the interior of Russia, which is connected with it by navigable rivers and canals. Steamship lines connect it with many European ports, but during the winter ice renders the port inaccessible to ships. C. contains many well-built houses; the population in 1894 was 42,603.

CROOK, a co. in w. central Oregon; bounded on the w. by the Cascade mts., and drained by the Des Chutes river; co. seat, Prineville; pop. 1890, 3244. Area, 8150 sq. m.

CROOK, a co. in n.e. Wyoming; 5250 sq. m.; pop. '90, 2338. Co. seat, Sundance.

CROOK, belonging to musical instruments, such as the French-horn or trumpet, is a circular tube, which fits into the end of the instrument next the mouthpiece, for the purpose of making the pitch of the instrument suit the key of the music; the notes of

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the parts for these instruments being always written in the natural key of C, with the name of the key of the piece marked in letters.

CROOK, GEORGE, b. Ohio, 1828; graduated at West Point in 1852. In the civil war he became maj.gen. of volunteers, and was in active service during the whole period. In 1873 he was made a brig.gen. in the regular army. He died in 1890.

CROOK, SHEPHERD'S. See PASTORAL STAFF.

CROOKED ISLAND, one of the Bahamas, contains 160 sq.m. and about 630 inhabitants. It lies to the s.e. of Long island, of which the n.w. extremity forms nearly the middle point of the chain. In common with some others of the group, it is valuable chiefly for its salt. In the exportation of this article, C. I. appears to stand third in order, its share counting about 12,000 bushels annually.

CROOKED LAKE, a handsome sheet of water in w. New York, about 18 m. long by 1 to 1¼ wide, lying in a deep valley. See KEUKA LAKE.

CROOKES, WILLIAM, a great physicist and chemist, born in London in 1832, was a pupil and assistant of Hofmann at the Royal College of Chemistry, next superintended the meteorological department of the Radcliffe Observatory, and lectured on chemistry at the Science College, Chester. In 1859, he founded the *Chemical News*, and in 1864 became also editor of the *Quarterly Journal of Science*. He was elected F.R.S. in 1863, vice-president of the Chemical Society in 1876, member of council of the Royal Society the year after, and in 1880 was awarded by the French *Académie des Sciences* an extraordinary prize of 3000 francs and a gold medal. He is an authority of the first rank on sanitary questions, especially the disposal of the sewage of towns, and his method of producing extreme vacua gave a great impulse to incandescent electric lighting. His original researches in chemistry and physics led to the discovery of the metal thallium in 1861, of the sodium amalgamation process for separating gold and silver from their ores in 1865, and of important discoveries in molecular physics and radiant matter, besides the invention of the RADIOMETER (q. v.). He is the author of *Select Methods of Chemical Analysis* (1871), and of other works. He was knighted in 1897.

CROOKES' TUBE. A glass tube containing a high vacuum for showing the phenomena of the ultra-gaseous state of matter. It is so called from the fact that William Crookes employed it in his experiments.

CROP. See BIRD.

CROPSEY, JASPER FRANCIS, b. N. Y., 1823; distinguished as a landscape painter. In 1847, he visited Italy, where he painted "The Pontine Marshes" and other pieces. Some of his works are "The Backwoods of America," "Autumn on the Hudson River," "Richmond Hill," "Niagara Falls," "Peace," "War," and "The Sibyl's Temple." He became a member of the National Academy of Design in 1851.

CROQUET, an open-air game, in which two or more players endeavor to drive wooden balls, by means of long-handled mallets, through a series of arches set in the ground according to some pattern. The player who first makes the complete circle of the hoops or arches wins the match; but during the progress of the game, each player may have the progress of his ball retarded by his adversaries, or assisted by his allies; and these friendly aids and hostile attacks constitute the chief interest of croquet. Although generally spoken of as a modern game, it seems to be really a revival with modifications of the sport with a mallet and ball which was popular in England in the days of the Stewarts, and gave the name Pall Mall to localities in various towns in England as well as on the continent (see BALL). The name (It. *palla*, a ball, and *maglio*, a mallet; Fr. *palemaille*), suggests an Italian origin; but the game was early in vogue in France, and thence passed into England, probably in the beginning of the 17th century. Blount's *Glossographia* describes the game as quoted in the article BALL, and gives figures of the mallets. This game seems to have gone out of fashion early in the 18th century. Who resuscitated it in its modern form, and how it got the name of croquet, are questions that have not been answered. Since 1850, C. has been a favorite game, and was for a time the most prevalent of all summer amusements, though latterly its charms have been shared by lawn-tennis and other sports.

THE IMPLEMENTS used in croquet are mallets, balls, posts (or sticks), and hoops (which are called indifferently hoops, wires, or arches). To these are sometimes added a cage, or a pair of tunnels; or hoops, tunnels, and cage may be all employed in the same game. The progress of each player may be marked with either clips or a marking-board.

The mallets should be light and handy; with ash shafts, and boxwood or ash heads. The heads of the mallets are of various shapes—as the dice-box, which is the most common shape; the plano-convex, the hammer-dead, and the cue-shape. The last, which came latest into use, has a flat end and a pointed end; the latter, like a billiard-cue, being tipped with leather. The head of the mallet should be from four inches to four and three quarters in length, by not more than two inches and three eighths at its greatest diameter, so that the center of the mallet-head should correspond to the center of the ball. The handle or shaft should be from two feet nine inches to three feet in length. Next the head there should be a ring or rings of paint, corresponding in color or number to the player's ball, and the series of colors on the starting and turning pegs.

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The balls are made of box or beech, thoroughly well turned and seasoned. Boxwood is generally preferred, but a ball composed of cocoa-nut fiber and india-rubber, which is very pleasant to play with, has also been used. These balls are perfectly round, are made of the correct size and weight, and are known as "Nicholson's patent compound croquet balls." The proper size of the balls is three inches and five eighths in diameter. Where wooden balls are employed, they should be kept rubbed with linseed oil when out of play.

A full set of croquet balls consists of eight. In order to determine the order of play, these are either severally painted, in whole or in part, blue, pink, black, yellow, brown, orange, green, and red; or distinguished by bearing a different number of stripes of the same color, four of them having from one to four red stripes, and the other four from one to four blue stripes.

The pegs are two or three in number, according to the particular style of game played. They are each about 2 ft. in height, round in shape, pointed at the lower end like a cricket stump, and painted in rings corresponding to the colors of the balls—the top line blue, and then pink, black, etc. When the numerical distinction of the balls is adopted, the pegs are painted in rings alternately of red and blue.

The hoops (wires or arches) are from six to ten in number, according to the plan of the game played. On the grounds of the All England club at Wimbledon, the hoops are only one eighth of an inch larger than the balls, but in private play they are usually much wider. They should not, however, be more than six inches in width. The hoops are made of galvanized iron, or iron painted white, and are either round or flat at the top; a hoop with the crown at right angles to the legs is to be preferred. When set, the crown of the hoop should be at least twelve inches clear of the ground. By having the hoops painted white or galvanized, they are easily distinguished in an imperfect light.

The tunnels are made of wood or iron, smaller than the hoops, with flat sides. When used, the player is sometimes restricted to one way of running them. They merely add to the difficulties of the game, and are not very popular or essential.

The cage consists of an additional pair of white hoops placed crosswise in the ground, either with or without a suspended bell at their junction.

Clips or disks of tin, marked with the several colors, are sometimes used to mark the game by being hung on the hoops as each player passes through; but many players do without the clips altogether. In the place of the clips, a *marking-board*, the same in principle as the pool-board in billiards, is often used.

Terms used in the Game.

In croquet, as in other games, there are various terms employed, which, to the uninitiated, often sound strange and meaningless. We mention the most indispensable.

Roquet (pronounced *rokay*).—The word is used to denote that when both balls are "in play," the striker's ball is caused by a blow of the mallet to hit another which it has not before hit in the same turn since making a point. The making a roquet gives the striker the privilege of croqueting (pronounced *krokaying*) the ball struck. A second roquet, without a point in the interval, does not count; but it may be made for the purpose of driving away an opponent's ball, cannoning, etc.; the striker's turn ending there, unless by the same stroke he make a point, or roquets another ball, which he has not previously struck during the round, and since making a point.

Croquet.—When one ball has roqueted another, the striker's ball is placed in contact with the one roqueted, the striker then hitting his own ball with the mallet. The non-striker's ball, when moved by a croquet, is called the *croqueted ball*. The striker is not allowed to put his foot upon the ball, as was formerly the case in what was known as *tight croquet*.

A loose croquet is made in three ways: first, by the striker placing his ball close to the one he has roqueted, and striking the former, in a line passing through the axis of each —by which plan the striker's ball remains almost stationary while the other flies forward; secondly, by the player striking the ball at any angle, so as to drive the balls in opposite directions. This is called a "splitting croquet." And lastly, by touching the roqueted ball slightly, with as little movement in the player's ball as need be. This last stroke is called "taking two turns off" the roqueted ball. In any case the latter must be sufficiently moved to satisfy the umpire as to the fairness of the stroke.

A rolling croquet is made by placing the two balls in juxtaposition as before, and the player striking his own ball in such a way as to make it follow after the ball struck. This is also called a "following stroke," and is made by striking your ball high; while in a *tight croquet*, you hit your ball below its center, and with a sudden drawback motion of the hand, as in making the screw in billiards. Considerable judgment is required to make the croquet in such a way as to assist your own game and encumber that of your opponent by one and the same stroke.

The side stroke is made by raising the mallet to the shoulder, and hitting your ball full in the center.

The straight stroke is made with the mallet held straight to the axis of the ball, perpendicularly in front of the body.

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Spooning is simply pushing the ball, which is considered unfair. The test of a spoon is that it makes no noise. The umpire must decide, on being appealed to, whether the ball is a *spoon* or a *tap*.

When a ball has been roqueted, the striker takes up his own ball, and places it close to the roqueted ball. He then makes his croquet as above described.

In play.—A ball is said to be "in play" as soon as it has run the first hoop; and it remains in play till it makes a roquet, when it is

In Hand.—The ball being "in hand," cannot score till it has made a croquet, after which it is again "in play;" but unless it makes a point, it continues "in hand" to the ball or balls it has croqueted for the remainder of its turn. When it has made another point, it is "in play" again to all the balls, as at the beginning of its turn.

Dead Ball.—A ball is said to be "dead" when it has run all the hoops "in order," and has struck the winning-peg.

In Order.—This term is used to signify the hoops, tunnels, cages, pegs, etc., in their regular order of play, according to the plan or arrangement adopted in placing them in the ground. When a player has made the complete round of the hoops in their proper sequence, he is said to have made his "tour" or "round" of play. The striker's hoop or peg *in order* is the one he has next to make. The game is won by the side or player succeeding in first driving the balls through the hoops, in order, to the turning-peg, and then back again to the winning-peg.

The starting and winning peg is the stake from which the play in the game proceeds. *The turning-peg* is the stake placed at the other extremity of the hoops, directly opposite the starting-peg; and round which the player must strike his ball before he makes the return-route.

To dismiss a ball is to strike it to a distance. *Running a hoop* is when a ball is struck fairly through the hoop next in order of play. *Rueing a hoop* is the failure of a ball to reach the hoop aimed at. The player who misses his first hoop is by some players known as a *booby*. *Ricochet* is the striking of a player's ball against two balls in succession. This stroke, which is sometimes called the double roquet, is precisely similar to the cannon in billiards *A wired ball* is one which cannot be croqueted, by reason of the leg of the hoop intervening. *A rover* is a player who has made the complete tour of the hoops "in order," and elects to remain in the game to assist his side and encumber their adversaries.

The Points of the Game.

The points reckoned are: 1, Running a hoop; 2, running a tunnel or cage; 3, striking a peg; each in the regular order of play.

1. A hoop is said to be "run" when a ball has fairly passed through it while in play. A ball is considered to have "passed its hoop" if it cannot be touched by a straight stick—as the handle of a mallet—laid on the ground parallel to the hoop on the side whence the player struck.

2. In running a tunnel, the ball must pass completely through; and in running a cage, the same test may be applied as for the hoop. Where a bell is suspended—as in the Eglinton game—it must be rung before the point can be scored by the player.

3. The peg must be fairly hit, so that the blow may be heard, or the peg be seen to be moved from its position.

The player is not compelled to play for a roquet or point. It is sometimes better play for him to strike his ball towards a particular spot, so that on his turn coming round he may make his hoop the more easily. But, of course, he is liable to be roqueted by a succeeding player.

The Game.

The game of croquet may be played by any number of players not exceeding eight—four on each side. It is common, indeed, when two players engage in a match, for each to have two balls. The committee of secretaries from various croquet clubs, which drew up the now universally recognized Conference Code of Laws, recommend the game where there are two players on each side in preference to any other. The hoops being set according to the usual plan (see p. 477) or in any other way decided on by the players, the game commences by the choosing of "sides." The players, for distinction's sake, take balls and mallets of opposite colors—those on one side choosing, say, blue, black, brown, or green; those on the other, the light balls—pink, yellow, orange, or red. This done, the players address one another as pink, brown, etc., according to the color of their balls. When the balls are marked by different numbers of rings, one side takes the balls with red rings, the other those with blue rings, the players being then addressed as one red, three blue, etc.

The player whose ball is nearest the top of the peg—according to any succession of colors that may be adopted or determined on—starts from a mallet's length of the *starting-peg*, and endeavors to strike his ball through the first hoop. If he fail in "running his hoop," he must wait till his turn comes round again; his ball, meanwhile, remaining on the ground to be struck (roqueted) or croqueted by any of the succeeding players. If, however, the player succeed in making his first hoop, he goes on to strike his ball through the second hoop, and so on till he fail; which, from the peculiar angles or lines

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of direction between the hoops, he will probably do at his third hoop. The other colors then play in their order. It is unnecessary to follow all their strokes; but let us suppose that orange, whom we will make a lady, is just passing through her second hoop, blue, pink, black, yellow, and brown lying in various positions, in the neighborhood of the third and fourth hoops, one or other of which they are severally desirous of threading. Orange, having passed her ball through a hoop, is entitled to another hit. Carefully calculating her distance, she strikes her partner, yellow, gently, just impelling that ball towards the mouth of the hoop, through which yellow has to pass. The same stroke brought orange nearly below the third hoop, which a long stroke would enable it to pass. Like passing a hoop, striking another ball—friend or foe—gives another turn; consequently, orange has a choice before her. She may aim for the third hoop, and, as she is a good player, probably passes it; but the distance is considerable, and any pebbles or slight irregularity in the ground may cause her ball to diverge from the direction in which it was struck. On the other hand, as there are several balls in her vicinity, she prefers to work her way to the hoop by successive strokes among her neighbors, distributing favors as she goes. Blue, an enemy, lies nearest, still anxious for his third hoop. A gentle tap with the mallet brings orange against him. This entitles her either to another free stroke or to a croquet. She chooses the latter, and to perform it, selects a spot as unfavorable as possible for blue. The turning-peg seems suitable; she lifts her ball, places it at the side of blue farthest from the turning-peg, and bringing down the mallet with a sharp stroke upon her own ball, sends her azure enemy flying over the lawn in the direction of the turning-peg, and even beyond it; while her own ball advances a comparatively small distance. Having croqueted, she is entitled to another turn. She similarly croquets pink; but pink being a friend, she croquets him through his hoop and well up for his fourth hoop. Black escapes orange's attention, and she, after croqueting pink, passes the hoop herself, by so doing acquiring another turn; and as she has passed a hoop between, she may again aid yellow or pink, or pass on to her other hoops herself, as she pleases. With the aid thus obtained from other balls, a good player may sometimes pass the whole round of hoops without being once stopped.

When a player has passed all the hoops on the one side, he makes his way round the turning-peg, and proceeds to run the hoops on the other side, in the contrary direction, but with the same restrictions and methods as before. Having passed through the last hoop, he may proceed to strike the starting-peg, which is also the winning-peg. By doing so, he is out, or "dead," and of course can play no more. If, however, he be a good player, he may considerably benefit his friends, and annoy his enemies, by becoming a "rover," and traveling about from hoop to hoop, aiding his partners against their foes. Of course, if a rover be a clever player, the opposite side will do their best to strike his ball against the winning-peg, and so stop his further ravages. On the other hand, if he be an awkward croqueur, it is best to let him live, as his side cannot win, though all his partners be out, so long as he can be kept afield.

This description, with the aid of the rules and definitions of terms, will, we fancy, enable anybody to play croquet without much trouble.

Each side should use a captain or leader to conduct the game; and it is also well that an umpire, who thoroughly understands the theory and laws of croquet, should be selected to decide disputed points.

The Arrangement of the Hoops.

Various plans for the placing of the hoops have been adopted by croquet players; but the general principles of the game are the same in all cases, whatever the shape of the ground or the disposition of the arches. The following is the original plan, and the easiest way of setting out the hoops; and a clever player *may* make the entire round without stopping:

To set out the hoops in this fashion, drive in the starting-peg (which is also the winning-peg), and set the first hoop in a straight line from it at a distance of 12 feet. Set the second hoop 10 ft. farther on; then draw a diagonal line of 20 ft. and set up the third hoop, with the fourth hoop 10 ft. distant in a straight line, and the fifth hoop 10 ft. farther. Then draw another diagonal of 20 ft., and set up the sixth hoop immediately opposite the second; carry the seventh hoop 10 ft. back in a straight line, and fix the turning-peg 12 ft. back, to correspond with the starting-peg. Afterwards, complete the other side in precisely the same way. Thus, the order of play will be from the starting-peg to hoop 1, and so on to the turning-peg, and thence back to the winning-peg. The perfect lines show the onward march of the balls, and the dotted lines their return. This arrangement is carried through all the diagrams here given. Of course the distance from hoop to hoop must be greatly governed by the space of the ground; but the proportions here indicated should be generally observed. A tape or line marked in feet or yards will be found of great assistance in setting out the hoops.

In small grounds, one of the hoops between the pegs may be dispensed with, only six hoops being then required.

Sometimes ten hoops are placed in a circle, with a cage in the middle, which arrangement makes the game rather more difficult; sometimes two extra pegs are added; in fact, the variety of figures which may be improvised by an ingenious captain is almost

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endless. But whatever the number of hoops, pegs, etc., and whatever the arrangement adopted, the main elements of the game are the same.

Laws of Croquet.

The following rules are those known as the Conference Code, drawn up by a meeting of the secretaries of various clubs, and the recognized standard in all public games:

1. *Mallets.*—There shall be no restriction as to the number, weight, size, shape, or material of the mallets; nor as to the attitude or position of the striker; nor as to the part of the mallet held, provided the ball be not struck with the handle, nor the mace stroke used.

2. *Size of Balls.*—The balls used in match-play shall be 3¾ in. in diameter.

3. *Choice of Lead and of Balls.*—It shall be decided by lot which side shall have choice of lead and of balls. In a succession of games the choice of lead shall be alternate, the sides keeping the same balls.

4. *Commencement of Game.*—In commencing, each ball shall be placed on the starting spot. The striker's ball, when so placed and struck, is at once in play, and can roquet another, or be roqueted, whether it has made the first hoop or not.

5. *Stroke, when taken.*—A stroke is considered to be taken if a ball be moved in the act of striking; but should a player, in taking aim, move his ball accidentally, it must be replaced to the satisfaction of the adversary, and the stroke be then taken. If a ball be moved in taking aim, and then struck without being replaced, the stroke is foul (see Law 25).

6. *Hoop, when run.*—A ball has run its hoop when, having passed through from the playing side and ceased to roll, it cannot be touched by a straight-edge placed against the wires on the side from which it was played.

7. *Ball driven partly through Hoop.*—A ball driven partly through its hoop from the non-playing side cannot run the hoop at its next stroke if it can be touched by a straight-edge placed against the wires on the non-playing side.

8. *Points counted to Non-striker's Ball.*—A ball driven through its hoop, or against the turning-peg, by any stroke not foul, whether of its own or of the adverse side, counts the point so made.

9. *Points made for Adversary's Ball.*—If a point be made for an adversary's ball, the striker must inform his adversary of it. Should the striker neglect to do so, and the adversary make the point again, he may continue his turn as though he had played for his right point.

10. *The Turn.*—A player, when his turn comes round, may roquet each ball once, and may do this again after each point made. The player continues his turn so long as he makes a point or a roquet.

11. *Croquet imperative after Roquet.*—A player who roquets a ball must take croquet, and in so doing must move both balls (see Law 25). In taking croquet, the striker is not allowed to place his foot on the ball.

12. *Ball in Hand after Roquet.*—No point or roquet can be made by a ball which is in hand. If a ball in hand displace any other balls, they must remain where they are driven. Any point made in consequence of such displacement counts, notwithstanding that the ball displacing them is in hand.

13. *Balls roqueted simultaneously.*—When a player roquets two balls simultaneously, he may choose from which of them he will take croquet; and a second roquet will be required before he can take croquet from the other ball.

14. *Balls found touching.*—If at the commencement of a turn the striker's ball be found touching another, roquet is deemed to be made, and croquet must be taken at once.

15. *Roquet and Hoop made by same Stroke.*—Should a ball, in making its hoop, roquet another that lies beyond the hoop, and then pass through, the hoop counts as well as the roquet. A ball is deemed to be beyond the hoop if it lies so that it cannot be touched by a straight-edge placed against the wires on the playing side. Should any part of the ball that is roqueted be lying on the playing side of the hoop, the roquet counts, but not the hoop.

16. *Pegging out.*—If a rover (except when in hand) be caused to hit the winning-peg by any stroke of the same side, not foul, the rover is out of the game, and must be removed from the ground. A rover may similarly be pegged out by an adverse rover.

17. *Rover pegged out by Roquet.*—A player who pegs out a rover by a roquet loses the remainder of his turn.

18. *Balls sent off the Ground.*—A ball sent off the ground must at once be replaced 3 ft. within the boundary, measured from the spot where it went off, and at right angles to the margin. If this spot be already occupied, the ball last sent off is to be placed anywhere in contact with the other, at the option of the player sending off the ball.

19. *Ball sent off near Corner.*—A ball sent off within 3 ft. of a corner is to be replaced 3 ft. from both boundaries.

20. *Ball touching Boundary.*—If the boundary be marked by a line on the turf, a ball touching the line is deemed to have been off the ground. If the boundary be raised, a ball touching the boundary is similarly deemed to have been off the ground.

21. *Balls sent off and returning to Ground.*—If a ball be sent off the ground, and

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return to it, the ball must be similarly replaced, measuring from the point of first contact with the boundary.

22. *Balls sent within 3 feet of Boundary.*—A ball sent within 3 ft. of the boundary, but not off the ground, is to be replaced as though it had been sent off; except in the case of the striker's ball, when the striker has the option of bringing his ball in, or of playing from where it lies.

23. *Boundary interfering with Stroke.*—If it be found that the height of the boundary interferes with the stroke, the striker, with the sanction of the umpire, may bring in the balls a longer distance than 3 ft., so as to allow a free swing of the mallet. Balls so brought in must be moved in the line of aim.

24. *Dead Boundary.*—If, in taking croquet, the striker send his own ball, or the ball croqueted, off the ground, he loses the remainder of his turn: but if by the same stroke he make a roquet, his ball, being in hand, may pass the boundary without penalty. Should either ball, while rolling after a croquet, be touched or diverted from its course by an opponent, the striker has the option given him by law 26, and is not liable to lose his turn should the ball which has been touched or diverted pass the boundary.

25. *Foul Strokes.*—Is a player make a foul stroke, he loses the remainder of his turn, and any point or roquet made by such stroke does not count. Balls moved by a foul stroke are to remain where they lie, or be replaced at the option of the adversary. If the foul be made when taking croquet, and the adversary elect to have the balls replaced, they must be replaced in contact as they stood when the croquet was taken. The following are foul strokes:—(*a*) to strike with the mallet another ball instead of or besides one's own, in making the stroke; (*b*) to spoon—i.e., to push a ball without an audible knock; (*c*) to strike a ball twice in the same stroke; (*d*) to touch, stop, or divert the course of a ball when in play and rolling, whether this be done by the striker or his partner; (*e*) to allow a ball to touch the mallet in rebounding from a peg or wire; (*f*) to move a ball which lies close to a peg or wire by striking the peg or wire; (*g*) to press a ball round a peg or wire (crushing stroke); (*h*) to play a stroke after roquet without taking croquet; (*i*) to fail to move both balls in taking croquet; (*k*) to croquet a ball which the striker is not entitled to croquet.

26. *Balls touched by Adversary.*—Should a ball when rolling, except it be in hand, be touched, stopped, or diverted from its course by an adversary, the striker may elect whether he will take the stroke again, or whether the ball shall remain where it stopped, or be placed where, in the judgment of the umpire, it would have rolled to.

27. *Balls stopped or diverted by Umpire.*—Should a ball be stopped or diverted from its course by an umpire, he is to place it where he considers it would have rolled to.

28. *Playing out of Turn, or with the Wrong Ball.*—If a player play out of turn, or with the wrong ball, the remainder of the turn is lost, and any point or roquet made after the mistake. The balls remain where they lie when the penalty is claimed, or are replaced as they were before the last stroke was made, at the option of the adversary. But if the adverse side play without claiming the penalty, the turn holds good, and any point or points made after the mistake, are scored to the ball by which they have been made (that is, the ball is deemed to be for the point next in order to the last point made in the turn), except when the adversary's ball has been played with, in which case the points are scored to the ball which ought to have been played with. If more than one ball be played with during the turn, all points made during the turn, whether before or after the mistake, are scored to the ball last played with. Whether the penalty be claimed or not, the adversary may follow with either ball of his own side.

29. *Playing for Wrong Point.*—If a player make a wrong point it does not count, and therefore (unless he have, by the same stroke, taken croquet, or made a roquet), all subsequent strokes are in error, the remainder of the turn is lost, and any point or roquet made after the mistake. The balls remain where they lie when the penalty is claimed, or are replaced as they were before the last stroke was made, at the option of the adversary. But if the player make another point, or the adverse side play, before the penalty is claimed, the turn holds good: and the player who made the mistake is deemed to be for the point next in order to that which he last made.

30. *Information as to Score.*—Every player is entitled to be informed which is the next point of any ball.

31. *State of Game if disputed.*—When clips are used, their position, in case of dispute, shall be conclusive as to the position of the balls in the game.

32. *Wires knocked out of Ground.*—Should a player, in trying to run his hoop, knock a wire of that hoop out of the ground with his ball, the hoop does not count. The ball must be replaced, and the stroke taken again; but if by the same stroke a roquet be made, the striker may elect whether he will claim the roquet or have the balls replaced.

33. *Pegs or Hoops not upright.*—Any player may set upright a peg or hoop, except the one next in order, and that must not be altered except by the umpire.

34. *Ball lying in a Hole or on Bad Ground.*—A ball lying in a hole or on bad ground may be moved with the sanction of the umpire. The ball must be put back—i.e., away from the object aimed at—and so as not to alter the line of aim.

35. *Umpires.*—An umpire shall not give his opinion, or notice any error that may be made, unless appealed to by one of the players. The decision of an umpire, when appealed to, shall be final. The duties of an umpire are—(*a*) to decide matters in dis-

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pute during the game, if appealed to; (*b*) to keep the score, and if asked by a player, to disclose the state of it; (*c*) to move the clips, or to see that they are properly moved; (*d*) to replace balls sent off the ground, or to see that they are properly replaced; (*e*) to adjust hoops or pegs not upright, or to see that they are properly adjusted.

36. *Absence of Umpire.*—When there is no umpire present, permission to move a ball, or to set up a peg or hoop, or other indulgence for which an umpire would be appealed to, must be asked of the other side.

37. *Appeal to Referee.*—Should an umpire be unable to decide any point at issue, he may appeal to the referee, whose decision shall be final; but no player may appeal to the referee from the decision of an umpire.

CROQUETTE (Fr., from *croquer*, to crush), a ball or mass of minced meat or fish, or rice or potato, highly seasoned, rolled in bread crumbs, and fried crisp and brown.

CRORE. See Lac.

CROSBY, a co. in n. w. Texas; formed 1876, and organized 1886; drained by branches of the Brazos river; 900 sq. m.; pop. '90, 346. Co. seat, Emma.

CROSBY, Howard, D.D. LL.D., b. New York, 1826; graduated at the university of New York; for some years its chancellor or president. From 1851 to 1859 he was professor of Greek, and subsequently held the same chair in Rutgers college. He was ordained in 1861, and became pastor of the First Presbyterian church in New Brunswick, New Jersey. From 1863-1891 he was pastor of the Fourth avenue Presbyterian church, New York. He was also for several years the president and the most active member of the society for the prevention of crime, making resolute fight against illegal liquor-shops. Besides a great many sermons and addresses, he published *The Lands of the Moslem; Notes on the New Testament; Social Hints for Young Christians; Jesus, His Life and Works, as narrated by the Four Evangelists; Thoughts on the Decalogue;* and an edition of the *Œdipus Tyrannus* of Sophocles. He died in 1891.

CROSBY, John Schuyler, b. Albany co. N. Y., 1839; was educated at the univ. of the City of New York; served in the civil war, and was three times brevetted for distinguished gallantry, and against the Indians under Gen. Sheridan; was U. S. consul at Florence, 1876–82; gov. of Montana territory, 1882–84; and in the latter year was appointed first assistant postmaster-gen., resigning, 1886.

CRO'SIER, a staff surmounted by a cross, which is carried before a bishop on solemn occasions. It is about 5 ft. long, is generally made of tin, and is hollow. Crosiers are generally gilt, and are often richly ornamented. The C. differs entirely from the pastoral staff, with which it is often nevertheless confounded—the latter having a circular head, in the form of a crook.

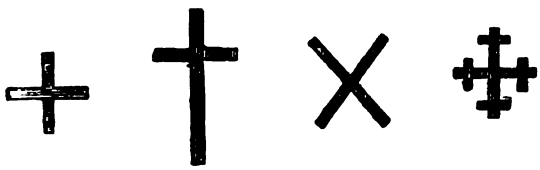
CROSS. The C. was a common instrument of capital punishment among the ancients; and the death of the C. was esteemed so dishonorable that only slaves and malefactors of the lowest class were subjected to it by the Romans. It was customary to proclaim the name and offense of the person crucified, or to affix a tablet (*album*) to the C., on which they were inscribed. Malefactors were sometimes fastened on a simple upright stake, and so left to die, or they were impaled upon it, and to this upright stake the Latin name *crux* was originally and more strictly applicable; but very generally a cross-piece (*patibulum*) was added to the stake, to which the arms of the criminal were tied, or to which his hands were nailed. When the cross-piece was fastened at right angles below the summit of the upright stake, the C. was called *crux immissa;* when the cross-piece was fastened at right angles across the top of the upright stake, the C. was *crux commissa;* and when it was formed of two beams crossing one another obliquely, it was *crux decussata.* The C. was erected without the gates of towns, but in places of frequent resort. The person crucified often lived for days upon the cross. The death of Christ by crucifixion, led Christians to regard the C. with peculiar feelings of reverence, and to make use of the sign of the C. as a holy and distinguishing sign. The custom of *crossing*, in honor and commemoration of Christ, can be traced back to the 3d century. The emperor Constantine, after obtaining the victory over Maxentius, through the influence—as he believed—of the sign of the C., caused crosses to be set up in public places and upon public buildings; and the veneration of the C. increased, particularly after the *Invention of the C.*, or finding of the alleged true C. of Christ in Jerusalem by the empress Helena. See Cross, Invention of. The desire for relics was gratified, and numberless portions of the true C. were given away, without its being diminished. Iconoclasts and others contended in vain against the prevalent worship of the C.; and the *crucifix* (q.v.), a C. with an image of the Saviour affixed to it, was honored more than any other image. The sign of the C. is made not only by Roman Catholics, but by the members of the eastern churches also; there are, however, distinctive differences in the manner in which it is made. It is admitted by the Lutherans as a commemorative sign of the atoning death of Christ, but by many Protestants is rejected as a human invention in worship, and as tending to superstition. It was very generally used during the middle ages, and still is among the less enlightened peasantry in some Roman Catholic countries, as a sort of charm, or as affording some security, like an amulet against all evil.

It appears that the sign of the C. was in use as an emblem, having certain religious and mystic meanings attached to it, long before the Christian era; and the Spanish conquerors were astonished to find it an object of religious veneration among the natives of

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Central and South America. Be this as it may, it was early adopted as a symbol by Christians, with express reference to the central fact of their religion, and it has been extensively used as an ornament in Christian architecture, and in the ground-plan of churches (q. v.). The C. of the resurrection is opposed to the C. of the passion, by ecclesiastical writers. It is a lance, headed by a C. instead of a pike, and carrying a banner upon which a C. is depicted. It is the C. held by the paschal lamb, and carried at the head of religious processions. The large C. always placed over the entrance of the main chancel of a church, was called the *rood* or *holy rood*.

The forms given to crosses in art are endless; but the two leading types are the Latin C., or *crux immissa*, supposed to be that on which Christ suffered, and the Greek C., both of which are subject to many fantastic variations. The Greek C. forms the well-known C. of St. George, which, adopted from the legends of that hero, was the national ensign of the English previous to the union with Scotland. The C. of St. Andrew differed entirely in form from the Latin or Greek cross. This C., or *crux decussata*, consisted of two shafts of equal length crossed diagonally at the middle, as in the annexed cut. According to the legend, this was the form of C. on which St. Andrew, the national saint of Scotland, suffered martyrdom. As the Scottish ensign, it is now blended with the C. of St. George in the Union Jack.



Greek Cross. Latin Cross. St. Andrew's Cross. Crosslet.

Many very beautiful crosses exist in England, upon the points of gables of churches, on gravestones, and in other situations, as also in heraldry. Among these, the C. most commonly seen is call the *C. crosslet*. In this figure, as seen in the annexed cut, the extremities are intersected, so as to make several small crosses. When employed in ecclesiastical architecture, the figure is usually carved in a florid or highly decorative style. When the C. crosslet is pointed at the lower extremity instead of being crossed, it is in heraldry said to be fitched, or *fitchée*. It is of frequent use in blazon.

Sanctuary, boundary, or *monumental crosses*, as they are called, consist of an upright flat pillar or obelisk, covered with sculptured devices, and set in a socket level with the ground. Occasionally, they appear to have marked boundaries, but more frequently were monuments over the graves of heroes, kings, bishops, etc. In some instances, they probably marked the verge of a sanctuary. The older of these crosses are said to be Scandinavian or Danish, and such are known as *runic crosses*, the term *rune* signifying a superstitious invocation. We are told that the island of Iona at one time possessed 360 crosses, but all are now destroyed or dispersed except one, called St. Martin's cross, standing in the grounds of the cathedral. It is a column of compact mica schist, 14 ft. high, 18 in. broad, and 6 in. thick, and is fixed in a pedestal formed out of a massive block of red granite, about 8 ft. high. In connection with certain ancient religious houses in Ireland, there were some very fine crosses of this kind; the most gigantic and impressive which still exist being that of St. Luke's in the county of Louth.

Memorial crosses are those which were erected in memory of some beloved object, or in commemoration of some event of local importance. In England, there are some superb crosses of this kind; they are popularly called *Norman crosses*. This species of C. resembled a Gothic turret set on the ground, or on a base of a few steps, and was decorated with niches for figures and pinnacles. The best known examples are those erected by Edward I. (1290) in memory of his queen, Eleanor; being placed on the spots where the body rested in its funereal progress to Westminster. The crosses at Waltham, Cheapside, and Charing were of the number. Those at Cheapside and at Charing are destroyed, but the C. at Waltham, though now much decayed, remains as a testimonial of the affection and piety of the greatest of the Plantagenets.

Town or *market crosses* were erected as stands to preach from, or in commemoration of events regarding which it was deemed proper to evoke pious feelings. As these structures were incorporated with or surmounted by a crucifix, the term *cross* was so indelibly associated with them that it survived the religious character of the fabrics. "The general intent of market-crosses was to excite public homage to the religion of Christ crucified, and to inspire men with a sense of morality and piety amidst the ordinary transactions of life."—Milner's *History of Winchester*. The earliest examples of this kind consisted, probably, of tall crucifixes of wood, such as are still seen by the waysides in some continental countries. Afterwards, stone shafts would be substituted; and according to the increase of market revenues, or progress of taste, these town crosses assumed that imposing character which they latterly possessed. Of the larger ornamental crosses of this kind, there are some striking specimens in England. We may refer to that at Cheddar in Somersetshire, and that at Malmesbury in Wiltshire; both are open vaulted structures, with a commodious space beneath, as a refuge for poor market-folks during rain, and surmounted with a kind of Gothic turret. At Chichester, Bristol, and Winchester, the market-crosses, while similar in form, are of a higher architectural quality. See Britton's *Architectural Antiquities*. Adjoining St. Paul's in London, stood Paul's C., a structure which we read of as early as 1259, in the reign of

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Henry III. It was essentially a town-preaching C., and is associated with some interesting occurrences in history. Before this C. the unfortunate Jane Shore was forced to do penance in the reign of Richard III., to whose malice she was made a victim. This event was followed by Dr. Shawe's infamous sermon, attempting to bastardize the children of Edward, and eulogizing Richard, who was present on the occasion. In front of this C. sat cardinal Wolsey, to hear fulminations against Luther; and about ten years later, by order of Henry VIII., preachers here delivered sermons in favor of the reformation. At this C., queen Elizabeth attended to hear a thanksgiving sermon for the defeat of the Spanish Armada. Here, sermons continued to be delivered until 1643, when, with other so-called relics of popery, the C. incurred the displeasure of the Puritans, and was demolished by order of parliament. Whatever was the original form of Paul's C., it was in later times a plain pulpit-like fabric of wood, covered with lead.

Scotland offers no specimens of memorial or Norman crosses, though, perhaps, we should make an exception in favor of the Scott monument, at Edinburgh, which is essentially a Norman C. of a gigantic order. See SCOTT, SIR WALTER. As regards the market-crosses of Scotland, they never attained to that elaborately ornate character which distinguishes such crosses as those of Chichester and Winchester. Yet the Scottish town-crosses had some distinguishing features. The more simple kind consisted of a shaft of stone, generally octangular in shape, and 12 or more feet in height. At top was an ornamental capital, which bore a dial and vane, or the figure of a unicorn. The shaft sprang from the top of a graduated flight of circular or octangular steps. A specimen of this species of C. is seen in the market-place of Melrose. The grander market C. consisted of a tall stone shaft, such as just described, but instead of steps, it sprang from the center of an imposing sub-structure. This structure was circular, hexagonal, or octagonal, and from 10 to 15 ft. high. The top formed a platform, which was surrounded with an ornamental stone parapet, and was reached by a stair inside. The sides of the building were decorated with pilasters, and bore various heraldic and other devices. Such were the crosses of Edinburgh, and such is the renovated C. of Aberdeen, the sides of which, however, are open. Losing their religious character, the Scottish market-crosses were employed for royal and civic proclamations, and as places where certain judicial writs were executed. The general removal of these ancient and interesting structures has been often matter of lamentation. The oldest C. of Edinburgh, which was the scene of a number of incidents connected with Scottish history, stood in the center of the High street, nearly opposite the entrance to the Parliament Square. It was removed in 1617, to make way for a royal pageant, the procession of James VI., on his first visit to Edinburgh after his removal to England. A new market-cross was then erected a short way further down the street, on the s. side. It consisted of an octangular sub-structure 16 ft. across, with a handsome stone shaft of about 20 ft. in height; its removal in 1756, by the civic authorities, is indignantly referred to by Scott in his poem of *Marmion*. Since its removal, royal proclamations, etc., are made on the site, which for such purposes is technically the market-cross of Edinburgh. With better appreciation of objects of archæological interest than prevailed in the 18th c., the shaft, or cross proper, was re-erected in 1869 within the railings of St. Giles.

CROSS, a co. in e. Arkansas, on St. Francis river; 672 sq.m.; pop. '90, 7693, includ. colored. It is level, and in some parts swampy, but fertile; producing corn, cotton, etc. Co. seat, Vanndale.

CROSS, in heraldry. If we assume the art of blazon to have originated in connection with the Crusades, it will not surprise us to find the symbol of the Christian faith so frequently introduced into the escutcheons of ancient and noble families everywhere in Europe. It is one of the honorable ordinaries, and, indeed, from its sacred character, is esteemed by heralds as the most honorable charge. Its form varies so much that Ménestrier counts 42 crosses; La Colombière, 72; and Guillim, 39. Most of the architectural crosses occur in heraldry, along with many others.

CROSS-BIRTH, a delivery, actual or attempted, when the child's head is not first presented at the mouth of the uterus, or in which the child lies transversely within the uterus.

CROSS, INVENTION OF THE, the name given in the Roman Catholic church to a festival which commemorates the finding of the alleged true C. of our Saviour, and which is celebrated on the 3d of May. The empress Helena, the mother of Constantine the Great, out of a desire of visiting the holy places, undertook a journey to Palestine in 326, though she was then near 80 years of age; and being animated with a great desire of finding the C. on which our Saviour suffered, she was so well directed, it is said, in the search which she instituted, that the C. was found, and with it the crosses of the two thieves; but the title being found separate from the C., a miracle readily determined which was the proper object of reverence. An order of friars, founded in honor of the invention of the cross, and carrying in their hand a staff, on the top of which was a C., received the name of *croisiers* (Fr. *croix*, cross), corrupted into *crouched* or *crutched* friars. They came to England in the 13th c., and had monasteries in London, Oxford, and Ryegate.—The festival of the *elevation of the cross* (14th Sept.) commemorates its re-erection in Jerusalem by the emperor Heraclius in 628, after it had been carried away by the Persians.

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CROSS, THE ORDER OF THE, originally a spiritual order of knighthood, which sprang up in Palestine in the time of the Crusades, and was then called the *Bethlehemite order.* After the commencement of the 13th c., the knights of this order adopted the monastic life, settling chiefly in Austria, Bohemia, Moravia, Poland, and Silesia. Pope Gregory IX. confirmed the order in 1328. Its principal seat is now in Bohemia, and its members generally hold ecclesiastical preferments or professorships in the university of Prague. They are distinguished by a C. of red satin, with a six-pointed star under it, and are sometimes called *stelliferi.*

CROSS, THE SOUTHERN, the most conspicuous constellation in the southern hemisphere, situated near the Antarctic circle, and therefore never visible to our latitude. It consists of four bright stars, to which the fancy, aided by Christian associations, readily gives the cruciform shape. The two brilliant stars which mark the summit and foot of the C. have nearly the same right ascension. The constellation, therefore, is almost perpendicular when passing the meridian, and these two stars act as pointers to the Antarctic pole.

CROSS, VICTORIA. The peculiarities of this decoration, which was instituted on the termination of the Crimean campaign in 1856, are, that it may be granted to a soldier of any rank, and for a single act of valor. The C. of the legion of honor, as was felt during the Crimean campaign, served a purpose in the French army which was served by none of our decorations, and it was in imitation of it that the Victoria C. was founded, with the inscription "For Valor," and which can be given to none but those who have performed, in presence of the enemy, some signal act of valor or devotion to their country. The general distribution of the crosses earned in the Crimean war took place in Hyde Park on the 26th June, 1857. The recipients were 62 in number. The Victoria cross is in the form of a Maltese cross, and is made of bronze. In the center is the royal crown, surmounted by the lion, and below, on a scroll, the words, "For Valor." The ribbon is blue for the navy, and red for the army. On the clasp are two branches of laurel, and from it the cross hangs, supported by the initial "V." The decoration is accompanied by a pension of £10 a year.

CROSSBILL, *Loxia,* a genus of birds of the family *fringillidæ,* much resembling bullfinches, linnets, etc., except in the bill, which is altogether singular; the two mandibles —which are rather long, thick at the base, and much curved—crossing each other at the points, when the bill is closed. In different individuals, even of the same species, the upper and lower mandibles are found variously directed to the right and left. This conformation was rashly characterized by Buffon as "an error and defect in nature, and a useless deformity;" whereas, it is an admirable adaptation to the wants and habits of the birds, and other peculiarities of their structure beautifully correspond with it— the bill being articulated to the head in such a manner that the mandibles are capable not merely of vertical but of lateral motion, and muscles of extraordinary power, in comparison with the size of the bird, being provided for moving them. The result of all this is, that the crossbills readily obtain their principal food, the seeds of firs and pines, by tearing up the cones. They bring the points of the mandibles together— which they can do so as to pick up a very small seed—and insert them into the cone, when a powerful lateral movement widens the opening quite sufficiently, and the tongue, which terminates in a singular movable scoop, formed of a bone articulated to the *os hyoides,* or ordinary bone of the tongue, is inserted to detach the seed. The power of the bill is such that it can be employed in its lateral movements to tear wood to pieces, and crossbills in confinement seem to take a mischievous pleasure in so employing it, and by this means, and pulling at wires, soon destroy any ordinary cage. An apple is cut to pieces almost in an instant, in order that its seeds may be reached; and flocks of these birds sometimes do great mischief in orchards. Only three species are known, all of which have been found in Britain, although only one, the common C. (*L. curvirostra*) is of frequent occurrence. It sometimes occurs in considerable numbers, but in most years is scarcely to be seen. It is a native of Europe, Asia, and North America, dwelling chiefly in pine forests, and extending as far n. as they do, not dreading the coldest climates. See illus., DEER, ETC.

CROSS BILL IN CHANCERY is a suit brought by the defendant against the plaintiff in the original suit, for the purpose of setting up some claim or defense which could not be maintained in the original suit.

CROSS-BOW. See ARBALEST, ARCHERS AND ARCHERY.

CROSS BREEDING. See BREED.

CROSS BUNS, a small cake specially prepared for Good Friday, and in many towns of England cried about the streets on the morning of that day as "hot-cross buns." *Bun,* means simply a round cake—properly, a lump, being from the same root as *bunion,* Ital. *bugno,* a bump or knob; allied is the Gael. *bonnach;* a cake, a *bannock.* Good-Friday buns were appropriately marked with the cross, and hence the name. The origin of the practice is obscure. Most probably it is a relic of some heathen observance, to which the early church gave a Christian significance. At Chelsea, there were formerly two celebrated bun-houses, besieged on Good Friday from morning until night by hundreds of eager purchasers, but they have long since disappeared.

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CROSSE, ANDREW, a remarkable experimenter on electricity, b. at Fyne court, in the Quantock hills, Somersetshire, June 17, 1784, was educated at Bristol and Brasenose college, Oxford, and in 1805–6, settled on his paternal estate, where he began to devote himself to the study of electricity. Happening on one occasion to examine a cavern near his residence, he found reason to conclude that the crystallizations on the walls and roof were partially, at least, the effect of the operation of this subtle agency. In 1807, he commenced experiments with the view of forming artificial crystals by electricity. He took home some of the water which dropped from the roof of the cave, and exposed it to the action of a voltaic battery for ten days, when he found crystals of carbonate of lime forming on the negative platinum wire. C.'s endeavors to form crystals of various sorts were very successful. After 30 years of quiet research, during which period he remained totally unknown to the learned world, he obtained no less than 24 minerals, crystals of quartz, arragonite, carbonates of lime, lead, and copper, besides more than 20 other artificial minerals. Explaining his discoveries at the meeting held by the British association for the advancement of science, at Bristol in 1836, he received high praise from its most distinguished members. On this occasion, he also expressed his belief that every kind of mineral would yet be formed by the ingenuity of man. But his most startling discovery occurred a few months after. While experimenting with some highly caustic solutions, out of contact with atmospheric air, there appeared, as if gradually growing from specks between the poles of the voltaic circuit, certain animals of the genus *acarus*. C. never affirmed that he had developed animal life out of inorganic elements, but simply that under certain physical conditions he could make acari appear, and not otherwise. He died July 6, 1855.

CROSS-EXAMINATION, the examination of a witness on behalf of the party against whose interest he has been called and has given evidence. The right of cross-examination exists in both civil and criminal cases. The object, of course, is to test the correctness of the evidence given, to disclose any prejudice, lack of intelligence, weakness of memory, or untruthfulness that may exist, and to break in any proper way the force of the direct examination. Greater latitude is allowed to counsel in cross-examining a witness than in adducing direct testimony. It has been well said that cross-examination calls for the highest degree of tact, skill, and knowledge of human culture. The law of evidence permits the cross-examination to cover the whole subject involved, not restricting it to points on which the witness himself had given evidence. Leading questions—questions, that is, which in their form indicate the answer desired—are allowable in cross-examination. The court will not hold the counsel as closely to relevancy in his questions in this kind of examination as in the direct. The character of the witness may be impeached by the questions asked, but he is never bound to answer a questions implicating himself in the commission of crime. At the conclusion of the cross-examination the witness may again be subjected to direct examination from the counsel who originally called him, but only on subjects touched upon in the cross-examination. The court may at any time be called on to protect the witness if he is subjected to abusive or improper questions by the counsel, and will often interfere for this purpose of its own accord. It may be said that threatening and bullying conduct on the part of counsel toward witnesses on cross-examination usually defeats its own purpose, and that the tendency of the best practice is toward increased courtesy in this regard. It is sometimes asserted that English judges allow counsel greater latitude in this respect than will be tolerated as a rule by courts in the United States. It is true, however, that in Great Britain, as well as in this country, the rights of a witness are now more clearly recognized and more closely protected than in times past.

CROSS FERTILIZATION. See FECUNDATION.

CROSS KEYS, in Rockingham co., Va., where a battle occurred (June 8, 1862) between the union forces under Fremont and the confederates under "Stonewall" Jackson. The contest was indecisive, and the losses were about equal—over 1000 killed and wounded on each side.

CROSSOPO'DIA, a genus of annelids determined from markings on the surface of Silurian slates. Nothing exhibiting structure has been observed—the surface of the slate is not even darkened by the organisms, which the markings show to have been nereid-like worms of some 6 in. in length. The extraordinary length, "probably many yards," which was ascribed to this animal, has been shown by Alexander Bryson to be founded on a confusion of the body with the track formed by the passage of the creature through a crisp rather than a slimy mud, the track having been filled up with dry dust.

CROSWELL, EDWIN, 1797-1871; b. N. Y.; for many years a leading democratic editor. He began his journalistic career on the *Catskill Recorder*, a journal established by his father. In 1823, he became sole editor of the *Albany Argus*, remaining in that position 31 years, in partisan warfare with his whig rival, Thurlow Weed. Croswell was one of the foremost of political editors and managers.

CROSWELL, HARRY, D.D., 1778–1858; b. Conn.; a journalist and clergyman. He was editor of *The Balance*, a federalist paper in Hudson N. Y., and of the *Wasp*, a less creditable publication, in which he published a libel on Jefferson. He was sued, and his defense by Alexander Hamilton was the last forensic effort of that great lawyer.

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In 1814, he took orders, and became rector of Trinity church, New Haven. He was the author of several devotional works.

CROTALA'RIA (Gr. *krotalon*, a rattle), a genus of plants of the natural order *leguminosæ*, sub-order *papilionaceæ*, deriving its name from the inflated pods in which the seeds rattle when ripe. The species are numerous; annual, perennial, and shrubby plants, natives of the warm parts of the world. Many of them have long, straight, slender stems and branches, and some of these yield valuable fiber, particularly *C. juncea*, the sunn (q.v.), or sunn hemp of India, an annual species, the fiber of which is now an important article of commerce. JUBBULPORE HEMP, also an important fiber, and regarded as stronger than sunn, is the produce of *C. tenuifolia*, a perennial species about 9 ft. high, a native of the s. of India, which, when growing in abundant space, throws out many branches; but when sown thick, grows with little branching. *C. burhia*, which naturally grows in very arid places, is also cultivated in Sinde for its fiber.

CROTA'LIDÆ, a family of venomous serpents, agreeing with *viperidæ* in their general form and appearance; in their large head, which is broad behind and has a short muzzle; in their short tail; and in having long fangs in the front of the upper jaw, which is destitute of other teeth; but differing from them in having a large pit—the use of which is not known—on each side of the face between the nostril and the eye; and in having the tail terminated by a sort of horny spine or by a rattle. Many of the most dangerous serpents of the warm parts of Asia and America belong to this family, which receives its name from the rattlesnakes (q.v.) (Gr. *crotalus*, a rattle) of America, and contains also the genera *trigonocephalus*, *craspedocephalus*, *lachesis*, etc.

CROTCH, WILLIAM, a distinguished musical composer, was b. at Norwich in 1775. His musical genius was quite as precocious as that of the great Mozart. When little more than three years old, it is said that he could play *God save the King* almost throughout with chords, and the accuracy of his ear was such that he could detect in a moment what note was struck, and in what key the music was composed. When only 22, C.'s abilities were so much appreciated that he was appointed professor of music in Oxford university, the degree of doctor of music being conferred upon him. In 1822, he obtained the principalship of the royal academy of music. C. composed a large number of pieces for the organ and piano, as well as many vocal pieces. He was author of *Elements of Musical Composition and Thorough Bass*, and *Styles of Music of all Ages*, 3 vols. He died Dec. 29, 1847.

CROTCHET. See MUSIC.

CROTON, a small river in Dutchess, Putnam, and Westchester cos., N. Y., supplying water for the city of New York. Its length is about 60 m., and it empties into the Hudson near Peekskill.

CROTON BUG. See WATER BUG.

CRO'TON, a genus of plants of the natural order *euphorbiaceæ*, having male and female flowers generally on the same plant; the male flowers with five petals; the female flowers with three styles, which are either forked or divided into many branches; the capsules 3-celled, with one seed in each cell. The species are numerous, mostly tropical or subtropical trees or shrubs, a few herbaceous. Some of them possess in a very high degree the acrid properties so characteristic of the order to which they belong. Among these, the most important is the PURGING C. (*C. tiglium*), a small tree, a native of India and the more easterly tropical parts of Asia. The leaves are extremely acrid; the wood in a fresh state is a drastic, and in a dried state, a more mild purgative; and the seeds (*C. seeds* or *tilly seeds*) are an extremely powerful drastic purgative, formerly much employed in Europe, but latterly disused on account of violence and uncertainty of action, although still valuable as yielding C. oil (q.v.). They are oval, or oval-oblong, about the size of field-beans. So great is their acridity, that dangerous effects have ensued from working for some hours with packages of them. The oil is obtained mostly by expression, and partly by treating the cake with alcohol.—The wood and seeds of *C. pavana* are employed in some parts of the east in the same way as those of *C. tiglium;* and the wood is supposed to be the *lignum pavanæ* or *pavanæ* of commerce. Other species possess similar properties.—Very different are the properties of the species which yield cascarilla (q. v.) and copalche (q.v.) barks, to which a great resemblance exists in the barks of a number of species, natives chiefly of America.—Other species are still more aromatic, and some delightfully fragrant, containing in great abundance a thickish, balsamic sap. The sap of *C. gratissimus* is much employed as a perfume and cosmetic at the cape of Good Hope; that of *C. origanifolium* is used in the West Indies as a substitute for balsam of copaiva; that of *C. balsamiferum*, also West Indian, furnishes *eau de mantes* by distillation; and the balsamic sap of some South American species is dried and used as incense.

CROTO'NA, or CROTON, a Greek colony in s. Italy, founded probably about 700 B.C., by Spartans and Achæans. It is said that in 510 B.C., the colony sent 100,000 men into the war with Sybaris, and overcame three times that number of their enemies. The colony seems to have vanished as rapidly as it rose. Crotona was celebrated as the seat of the school of Pythagoras.

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CROTON AQUEDUCT. See AQUEDUCT.

CROTON OIL is of an unctuous consistence, and varies in color from a pale yellow to a dark reddish-brown or deep sherry color. It is not miscible with water, but dissolves in alcohol and in ether. It has an acrid taste, and an unpleasant but characteristic odor, and is a powerful purgative, one drop of the pure oil being a sufficient dose. When rubbed upon the skin, it produces rubefaction and pustular eruption, and thereby tends to relieve some affections of the internal organs. It is used either by itself in the unmixed state, or diluted with olive oil, soap liniment, alcohol, etc. It is not to be employed except with caution.

CROTOPHAGA (Gr. tick-eater), a genus of birds of the order *scansores*, or climbers, allied to trogons and toucans, and of which some of the species are known by the names ANI and KEELBIRD, the former from their cry, the latter from the high, blade-like ridge which surmounts the short, much compressed, arched bill. The tail is fan-shaped. *C. ani*, often called the SAVANNA BLACKBIRD, is common in the West Indies and warm parts of America, inhabiting savannas and open pastures, particularly those which are occupied by cattle or horses, and feeding chiefly on insects, partly also on berries. It uses the sharp ridge of the bill in opening out earth, dung, etc., in search of insect prey. It often perches on the backs of horses or cattle, to feed on ticks, and may be seen clinging to a cow's tail; the important service which it renders being apparently well appreciated.

CROUP, a severe and fatal disease of infants, known from a remote period, but first scientifically described by Dr. Francis Home in 1765, as a suffocative affection of the breathing, depending upon the formation of a false membrane or fibrinous deposit on the mucous membrane of the windpipe or larynx (q.v.). It is proper to remark that the inflammatory disease described by Home has been frequently confounded with a purely spasmodic affection of the larynx, the asthma of Millar, or *laryngismus stridulus* of Dr. Mason Good; and also with diphtheria (q.v.), in which a false membrane is formed on the pharynx and palate, as well as in the larynx. C., in the more restricted sense, begins with symptoms resembling catarrh (q.v.), but differing in the greater degree of feverishness and hoarseness. In a short time, the respiration becomes difficult and noisy; a very peculiar hissing sound is heard accompanying the drawing of each breath; the cough is harsh and brassy; the countenance is injected, the expression very feverish and anxious, the voice entirely lost, or very much altered. This state is soon followed by one of suffocation, unless the little patient is relieved by expectoration, which, however, frequently takes place in the midst of vomiting or coughing, a quantity of membranous shreds being brought up from the windpipe along with glairy mucus, and sometimes streaks of blood. In the worst cases, the spasms of ineffectual coughing, and the constantly increasing obstruction to the breathing, are most painful to witness; and a period of tossing, extreme suffering, and anxiety is succeeded either by gradual insensibility, or by convulsions, which are very soon followed by death. True C. is rarely seen after the age of puberty, and is rather uncommon before the termination of the first year of life. It may occur, however, at any age, and has essentially the same characters as are above described. It is supposed to be due in some measure to endemic (q.v.), and partly also to epidemic (q.v.) causes. It is most common in cold and moist climates and seasons, and in low-lying, but exposed situations. The variations in its prevalence, however, are by no means fully explained. The treatment of C. requires to be very active and decided, and yet free from rashness. In cases of highly inflammatory type, and in robust children, it may be proper to take blood from the arm, or to place one or more leeches (according to the age of the child) over the top of the breast-bone. An emetic should also be given as soon as possible, composed of a full dose of tartar-emetic or of ipecacuanha, or both together. Some prefer sulphate of copper given in repeated doses: in America, a preference is given to alum and honey mixed into a paste, and given in tea-spoonful doses. The emetic may be repeated, if necessary, every 2 or 3 hours, and the child should at intervals be placed in the warm bath. It needs hardly be added that medical advice should be procured without a moment's delay, whenever it is within reach, for the disease is one of extreme danger, and almost all the most effective remedies require experienced hands for their safe administration. In extreme cases, tracheotomy (q.v.) has been resorted to with success.

CROUPIER (Fr., partner), at a gaming-table, the dealer or dealer's assistant.

CROW, *Corvus*, a genus of birds, the type of the family *corvidæ* (q.v.). The largest species of this genus is the raven (q.v.). The rook (q.v.) also belongs to it. Besides these and the jackdaw (q.v.), there are two other species found in Britain, the COMMON or CARRION C. (*C. corone*), and the ROYSTON C. or HOODED C. (*C. cornix*). They differ from one another chiefly in color, the carrion C. being black, the hooded C. gray, with black head, throat, wings, and tail. The hooded C. is also rather larger than the carrion C., which, in size, nearly agrees with the rook, but which may readily be distinguished from that species by having the base of the bill and the upper part of the throat not naked and rough, but closely feathered. The name hooded C. is derived from the appearance of the black head, contrasted with the gray body, but in some parts of Scotland is, without any show of reason, popularly transferred to the carrion C., under

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the form *hoody*. Both of these species have habits much more resembling those of the raven than of the rook; they seldom or never associate in flocks, and not only prefer carrion to worms, insects, or vegetable food, but watch and attack very weak animals, such as young lambs. On this account, a premium is in many places given for their destruction, and gamekeepers relentlessly pursue them on account of their robbing nests, from which they take either the eggs or the helpless young. Their own nests are built in trees, or if these are not to be found, among high rocks. They both occasionally frequent the sea-coast, feeding on shell-fish, etc. Both are widely distributed over Europe and the northern parts of Asia.—The C. of North America (*C. Americanus*) is very similar to the carrion C., but rather smaller, and, after the breeding season is over, congregates into great flocks: it is also partially migratory, great numbers from the more northerly parts moving to the s. on the approach of winter. Its habits are otherwise intermediate between those of the carrion C. and the rook.—The FISH C. (*C. ossifragus*) frequents the coasts and southern rivers of the United States, feeding chiefly on fish, which it catches with great dexterity. It also sometimes assails gulls, and compels them to disgorge their prey.—The JABBERING C. (*C. Jamaicensis*) of the Blue mountains of Jamaica is remarkable for the resemblance of its voice to human speech, which some of the other species of this genus, as the raven, it is well known, can be taught to imitate. Sir J. E. Tennent gives an interesting account of the small glossy C. of Ceylon (*C. splendens*), which frequents the towns, feeding on offal, and boldly entering rooms through open windows, to snatch some morsel from the dinner-table. Habits of pilfering are more or less prevalent among the different species of crow.—The RED-LEGGED C. is the chough (q.v.).—The name CARRION C. is given in America to the BLACK VULTURE. See VULTURE.—The PIPING C. of New South Wales is a baritah (q.v.).

CROWBERRY, or CRAKEBERRY, *Empetrum nigrum*, a small procumbent shrub, of the natural order *empetraceæ*, a native of the northern parts of the world, abundant in the moors of Scotland and the n. of England. The order consists of a few heath-like shrubs, which, however, are regarded as having a botanical affinity to *euphorbiaceæ* (spurges, etc.), with small unisexual flowers in the axils of the leaves, the fruit a small berry seated in the persistent calyx. The berries of the C. are nearly black, surround the branches in crowded clusters, and each contain 6 to 9 bony seeds and a watery acidulous juice, which is sometimes felt to be not unrefreshing; but they are generally little esteemed. A fermented or vinous liquor is prepared from them in some northern countries. They are a favorite food of game. *E. rubrum*, a native of the vicinity of cape Horn, differs little from the northern plant, except in having red berries.

CROWDIE, a mixture of cold meal and milk, also oatmeal and boiled water mixed with treacle or sugar and butter.

CROWFOOT. See RANUNCULUS.

CROWLAND, or CROYLAND, an ancient t. in the s. of Lincolnshire, on the Welland, in a low flat district in the Fens, 48 m. s.s.e. of Lincoln. There once existed here a large abbey, built about 1200, and there still exist the remains of a church founded by king Ethelbald in the 8th c. At the confluence of the Welland and the Nene there is a curious triangular bridge, built probably in the 14th c. on the site of an older one erected about 860. Ingulfus, the historian, was abbot of Croyland. Pop. '91, about 3000.

CROWN (Lat. *corona*, Wel. *crwn*, and Gael. *cruinn*, round). Crowns were originally garlands of leaves; and in this form they have probably been used as an ornament for the head by almost every people. They were much used by both the classical nations on joyous and on solemn occasions. Among the Greeks, the C. (*stephanos*) was sometimes used as an emblem of office, as in the case of the archons; sometimes as an ornament for the heads of the victors in the public games; and sometimes as a mark of distinction for citizens who had merited well of their country. Crowns of the latter class were made at first of twigs of laurel, but latterly of gold. The Romans made use of crowns to a greater extent than the Greeks, chiefly as rewards for valor. The most highly prized was the *corona obsidionalis*, which was bestowed by a beleaguered garrison or army on the general who rescued them. It was made of grass or wild-flowers, gathered from the place which had been inclosed by the enemy. Next in order was the *civic C.*, a garland of oak-leaves and acorns, which was given as a reward to any soldier who had saved the life of a Roman citizen in battle. For the soldier who wore it, a place next to the senators was reserved at the public spectacles, and both the senate and the assemblage rose up on his entrance. Not only he, but his father and paternal grandfather were free from all public burdens; and the person whose life he had saved was bound ever after to show him the duty which a son owes to a father. The civic C. is sometimes used in heraldry.

Another of the Roman crowns was the *corona muralis*, which was bestowed on him who first scaled the wall of a besieged city. It was a golden ring surmounted with turrets or battlements. It is often used in modern heraldry.

The *corona triumphalis*, which was of three kinds, was bestowed upon a general when he obtained a triumph

But there was a totally different class of crowns, which were not honorary, but emblematical, and which were not regulated by law, like the former ones, but by custom.

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Of these, the most important were: 1. The *corona sacerdotalis*, worn by the priests and bystanders when engaged in sacrifice, with the exception of the *pontifex maximus*. It was sometimes of olive leaves, sometimes of ears of corn, and sometimes of gold. 2. *Corona funebris* or *sepulchralis*, with which the dead was crowned, a custom which prevailed both among the Greeks and Romans. A law of the twelve tables provided that if any one had been crowned while living, the C. should be placed on his head when carried out to burial. Crowns were also placed on the bier, and scattered from the windows under which the procession passed. In Greece, these crowns were commonly of parsley. 3. *Corona convivialis*. The custom of wearing wreaths on festive occasions, which, like most of the Roman customs, was derived from Greece, is supposed to have originated in the habit of tying a woolen fillet round the head, to mitigate the effects of intoxication. As luxury increased, they were made of such flowers and shrubs as were supposed to prevent intoxication, roses, violets, myrtle, ivy, and even parsley. 4. *Corona nuptialis*, or bridal-wreath, made of flowers plucked by the bride herself, and not bought, which was of bad omen. Amongst the Romans, it was made of verbena. 5. *Corona natalitia*, a chaplet suspended over the door of the vestibule in which a child was born.

Several other classical crowns are mentioned in the very elaborate article on the subject in Smith's *Dictionary*, to which we have been indebted for much of the preceding information.

As the emblem of sovereignty in modern Europe, the C. was borrowed rather from the diadem (q.v.) than the crowns of antiquity. This decoration was originally oriental. Alexander the great adopted it from the kings of Persia; and Antony assumed it during his luxurious intercouse with Cleopatra. According to some, its adoption for the gods originated in the fillet, which was assigned to Bacchus for the purpose mentioned as that which led to the use of the convivial crown. In modern states, crowns were of very various forms, till heralds devised a regular series of them to mark the various gradations of sovereignty, from that of the emperor down to what are now called the coronets of counts and barons. The pope also had his triple crown. See TIARA. So entirely was the C. regarded as the symbol of sovereignty, that the word came often to be used as synonymous with the monarchy—a sense in which we still speak of the C. of England, and the domains and possessions of the crown.

The crowns of kings and emperors are closed above, whilst the coronet of a noble is merely an open circlet surrounding the head; hence, *to close the C.* has been the ambition of princes desirous of shaking off the authority of feudal superiors, and assuming a complete sovereignty.

The royal C. of Great Britain is a circle of gold enriched with stones and pearls, and heightened with four crosses pattée, and four fleurs-de-lis alternately. From these rise four arch-diadems, adorned with pearls, which close under a mound, ensigned with a cross pattée. The C. used at the coronation of queen Victoria was adorned in accordance with the taste of the present time.

The coronet of the prince of Wales is a circle of gold, set round with crosses pattée and fleurs-de-lis, but has only one arch, decorated with pearls, surmounted with a mound and cross, and bordered with ermine. In addition to his coronet, the prince of Wales has a cognizance consisting of three ostrich feathers, argent, quilled or, enfiled with a prince's coronet of the last, with an escrol azure, whereon are the German words *Ich dien* (I serve). For the traditionary origin of this badge, see PRINCE OF WALES.

The younger sons and brothers of the sovereign wear as coronet a circle of gold, bordered ermine, heightened with fleurs-de-lis, crosses pattée, and strawberry leaves alternately. Nephews of the blood-royal have strawberry leaves on their coronets, where the sons and brothers have fleurs-de-lis. Princesses-royal have a circle of gold, bordered with ermine, and heightened with crosses pattée, fleurs-de-lis, and strawberry leaves alternately. For the coronets of the different orders of nobility, see their *titles*.

THE CROWN is a term often employed to signify the state, and the matters under control of the executive authority. Thus, in the interests of the state there are C. ministers, C. lawyers, C. officers, C. lands, etc.—the term, in no instance, having any special connection with the sovereign personally. In Scotland, certain high crimes are technically called pleas of the crown. These are four in number—murder, robbery, rape, and willful fire-raising—and fall within the jurisdiction of the high court of justiciary. Likewise, in Scotland, there is a functionary styled C. agent. He is a practicing law-agent or solicitor, who, under the lord advocate and his deputies, takes charge of criminal proceedings. His duty is to receive from the procurators-fiscal of the different counties the precognitions which they have taken, and to lay these precognitions before the lawyers for the crown, that they may determine whether there is ground sufficient to call for a prosecution. He also expedes indictments and criminal letters, and otherwise discharges the duties of an agent in preparing and assisting in the conduct of trials before the high court of justiciary, which are generally superintended or conducted by the solicitor-general. The appointment of the C. A. is with the lord advocate, and ceases with the administration.

CROWN DEBTS. It is a prerogative of the crown to take precedence of all other creditors, and in England, to recover its debts by a summary process called an *extent*. By 33 Henry

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VIII. c. 39, this preference is given over all creditors who have not obtained judgment for their debts before the commencement of the crown's process; and the act 6 Anne, c. 26, extended the law of England in this respect to Scotland. The rule in Scotland, however, was limited to movable or personal property, and the crown has no privilege over a subject in competition for heritage. It obtains, however, as opposed to the landlord's hypothec (q.v.). Mercantile sequestration has no effect against the crown. The sanctuary of Holyrood house affords no protection to the king's debtor. See Exchequer, Court of.

CROWN GLASS, used for windows chiefly, and composed of 100 sand, 35 potash, and 35 chalk; nearly a silicate of soda and lime.

CROWN and **HALF-CROWN**, English silver coins since 1551. Before that date they were made of gold. The crown is worth $1.25 in United States currency.

CROWN IMPERIAL. See Fritillary.

CROWN LANDS. The demesne lands of the crown are now contracted within narrow limits, having been almost entirely granted away to subjects. King William III. so impoverished the crown in this manner, that an act was passed, 1 Anne, c. 7, s. 5, the effect of which and of subsequent statutes is, that all grants or leases from the crown of royal manors, or other possessions connected with land, for a period exceeding 31 years, are void. At a much earlier period (1455, c. 41), a Scottish statute had rendered the consent of parliament necessary to the alienation of the property of the crown; but neither it, nor the subsequent statutes, which were passed with a similar object, succeeded in checking the practice. The superintendence of such property as still belongs to the crown is now vested in commissioners appointed for the purpose, called the commissioners of woods, forests, and land revenues. See Forest Laws.

CROWN POINT, a town in Essex co., New York, on the w. side of lake Champlain, about 100 m. n. of Troy. Being within the basin of the St. Lawrence, it formed part of French Canada. With the view of bridling the English on the s., it was made the site of a fort famous in the American war, but of which now only the ruins remain. The town contains the villages of Hammondville, Ironville, and Factoryville. Pop. '90, 3135.

CROWN PRINCE, the heir-apparent of the Prussian throne. The title is used also in Sweden and Austria.

CROWN SAW, a circular saw formed by cutting a set of teeth in the edge of a cylinder, as in a surgeon's trepan. The handle is placed transversely, like that of a gimlet. It is principally used in operations on the cranium, and is also sometimes made in a semi-circular form.

CROWN SOLICITOR, the solicitor to the treasury, who, in state prosecutions in England, acts as solicitor for the crown in preparing the prosecution. In Ireland, there are crown solicitors attached to each circuit, whose duties correspond in some degree to those of the procurators-fiscal and crown agent in Scotland. See Crown. In England, there are no analogous officers, and prosecutions are consequently conducted by solicitors appointed either by the parish, or by private parties.

CROWN-WORK, in fortification, is formed to strengthen a weak front, or to occupy ground which might facilitate the enemy's operations. It consists of two faces inclined to each other at an angle, with a bastion in the middle, and half-bastions at the two ends; and it is connected with the main body of the work by two long sides. Both of these works are entirely beyond the main ditch of the place, but each has also a ditch of its own. See illus., Fortification, vol. VI.

CROWS, or Absaroka, a tribe of Indians living around the Big Horn river in the state of Montana, and reported in 1890 as numbering 2287 souls. They have been generally at peace with the whites; are expert hunters and warriors, and considerably advanced in civilization. They are tall, well built, and very proud of their wonderfully long hair. Catlin gives a picture of a chief whose hair swept the ground when he stood erect.

CROW'S-FEET, in siege operations. See Calthrop.

CROW-STONE, the top stone of the gable end of a building. See Corbie Steps.

CROW WING, a co. in Minnesota, on the Mississippi river, intersected by the Northern Pacific and the Brainerd and Northern Minnesota railroads; 550 sq. m.; pop. 1890 8852. Co. seat, Brainerd.

CROYDON (Fr. *croix dune*, chalk-hill), a t. in the n.e. of Surrey, on the London and Brighton railway, 10¼ m. s. of London bridge. It lies on the edge of the chalk and plastic clay, near the Banstead downs, at the source of the Wandle. C. was one of the first towns in England to grapple effectually with the question of the economical disposal of town-sewage. In 1868, owing to the rapid growth of the town, new waterworks were completed. The water, which is of great purity, is obtained from an artesian well. It is a very important railway center. Pop. '91, 102,697. The archbishops of Canterbury had a palace here till 1757. This palace is occupied by a girls' school, and the summer seat of the archbishops is now at Addington, 4 m. e. of Croydon. About a m. from C. is Addiscombe house, at one time the

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residence of the first earl of Liverpool, but purchased by the East India company in 1809. When enlarged by other buildings, it became a military academy, at which cadets were educated for the artillery and engineer services of the company. At a later date, the infantry cadets also received their professional education there. In 1858, when the government of India was transferred from the company to the crown, Addiscombe academy was transferred in like manner, and became the royal military college. This college no longer exists; the buildings were demolished in 1863; and the site has been covered with streets of villas. C. has one of the finest Gothic churches in the county.

CROZET ISLANDS, a volcanic group to the s. of the Indian ocean, lie between Kerguelen's land on the e. and prince Edward's islands on the w., about midway between Patagonia and New Zealand. The most easterly link of the chain is in lat. 46° 27′ s., and long. 52° 14′ east.

CRU'CIAN, *Cyprinus carassius*, a fish of the same genus with the carp (q.v.), from which it differs in the want of barbules at the mouth, in the much greater depth of body, and in the almost square tail. It attains a considerable size. It inhabits lakes, ponds, and slowly flowing rivers, in the n. of Europe and of Asia. It is called *karussa* in Sweden. It exists in the Thames, although rare, and is called the *German carp*, but has perhaps been introduced. It is an excellent article of food. The introduction of the C. into some of the waters of the northern parts of Britain seems particularly desirable.

CRU'CIBLES are vessels employed for the heating and fusing of glass, metallic ores, etc., and are generally made of materials capable of resisting high temperatures, such as fire-clay, black-lead, porcelain, platinum, and silver.

CRUCI'FERÆ (Lat. cross-carrying), an important natural order of exogenous plants, including about 1600 known species, and corresponding with the class *tetradynamia* of the Linnæan system. See BOTANY. The flowers have a calyx of four sepals, which fall off after flowering; and a corolla of four petals, which are placed in the form of a cross—whence the name C.—and alternate with the sepals. There are six stamens; four long ones in opposite pairs, and two short ones between the pairs of long ones. The ovary is superior, and there are two stigmas. The fruit is either long and podlike (a *silique*), or a short and roundish *pouch* (*silicule*); one-celled, or (usually) spuriously two-celled, by the parietal placentæ (see PLACENTA) meeting in the middle, and forming a kind of dissepiment (q.v.); and contains either one seed, or many in a single row. Linnæus divided his class *tetradynamia* into the orders *siliquosa* and *siliculosa*, according to the form of the fruit, and these may also be regarded as forming sub-orders of this natural order; but another division has more recently been adopted, founded on the character of the cotyledons and the manner in which the radicle is folded upon them (cotyledons *accumbent*, *incumbent*, or *conduplicate*). The general character of the order is antiscorbutic and stimulant, with more or less acridity. It contains many plants extensively cultivated for the food of man and of domestic animals, or valuable in medicine, as kale (cabbage, cauliflower, broccoli, colewort, etc.), turnip, rape, radish, cress, horse-radish, scurvy grass, mustard, sea-kale, gold of pleasure, etc The dye-stuff called woad is produced by a plant of this order. It includes also a number of garden-flowers highly esteemed for their beauty and fragrance, as wallflower, stock, rocket, etc. The pungency and acridity of the C. seems to depend on a volatile oil, or on different volatile oils of very similar character, present in very various degree in different species, or in the same species under different circumstances, and in different parts of the same plant. This diversity is very well illustrated in the common turnip; in the different qualities of the root, as to sweetness and acridity, in different soils or seasons, and in the difference between the flesh and the rind. The seeds of the C. contain a fixed oil, which is extracted from some (rape, colza, in Europe; *myagrum sativum* and *erysimum perfoliatum* in Japan), to be used as a lamp-oil and in the arts, and the oil-cake is valuable for feeding cattle. The plants of this order belong mostly to the temparate parts of the world, and particularly abound in Europe. Comparatively few are found within the tropics.

CRU'CIFIX (Lat. *crux*, the cross, and *figo*, I fix), a cross with the effigy of Christ fixed to it. The principal C. in Roman Catholic churches stands in the center of the high-altar. It overtops the tapers, and is only removed at the elevation of the host. In well-appointed churches, the altar crucifix is generally either of gold or silver. Crucifixes are used in Lutheran churches, and in Prussia they are often made of Berlin iron. The C. first began to take the place of the plain cross in the time of Constantine, but it was never publicly acknowledged by the Greek church, and did not come into general use in the east till towards the end of the 8th century. It was not till the Carlovingian age that it became general in the Latin church. On the earlier crucifixes, Christ is represented as alive, with open eyes, and generally clad, and fastened with four, not three nails. In later times, all these circumstances varied. Christ was often represented as dead, naked, except a cloth round the loins, and fastened with three nails; i.e., the two feet fastened together by one nail. The earlier artists usually represented the figure of Christ as haggard, and his countenance as sorrowful in the last degree; but latterly the custom was introduced of representing him as the ideal of human beauty, and of throwing into his countenance an expression of rapture and heavenly joy. See CROSS.

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CRUDEN, ALEXANDER, was b. at Aberdeen, 31st May, 1700, and educated at Marischal college, with a view to the church, but having exhibited decided symptoms of insanity, he was for some time placed in confinement. On his release, he left Aberdeen, and after spending several years as a tutor, settled in London in 1732, first as a corrector of the press, and afterwards as a book-seller. In 1737, appeared his *Complete Concordance of the Holy Scriptures of the Old and New Testament*, a really great work, which has laid divines especially under deep obligations to the laborious author. The book was dedicated to queen Caroline, who graciously promised to "remember him," but unfortunately died a few days after. C. now relapsed into insanity, and his friends were obliged to remove him to a private asylum, where he appears to have been harshly treated. On his recovery, he published an account of his sufferings. For the next fifteen years he acted as a corrector of the press, but, in 1753, he had again to be put under restraint, but only for a few days. C. now believed himself divinely commissioned to reform the manners of the world, and styled himself Alexander, *the corrector*. He went about the country exhorting the people to keep holy the Sabbath day, etc. He also petitioned the king for the honor of knighthood, and the parliament to constitute him by act, "the corrector of the people," hoping by such honors to influence the people more effectually. Several other foolish things were done by C. in the course of his life, but he also performed many virtuous and benevolent actions, which shed a pleasing light over his melancholy career. C. died at Islington, Nov. 1, 1770. There have been many editions and abridgments of C.'s concordance published both in Britain and America. One of the best known is that of Chalmers (London, 1812; 10th ed., 1824).

CRUGER, the name of a prominent Dutch family of New York. JOHN was a slave-trader, a successful merchant, mayor of New York in 1759, and a member of the first provincial congress. JOHN HARRIS, nephew of John, was a British officer. After the war of independence he fled to England, and his property was confiscated. HENRY, brother of John Harris, was a member of the English parliament, and with Burke opposed harsh treatment of the American colonies.

CRUIKSHANK, GEORGE, one of the most gifted of English pictorial satirists, was b. in London, Sept. 27, 1792. His father was a native of Aberdeenshire, and the son of a person who had fought for prince Charles Stuart at Culloden. C. at first thought of the stage as a profession; but some of his sketches having come under the notice of a publisher, he was induced to engage in the illustration of children's books and songs. When about twenty years of age, a publication, called *The Scourge*, afforded scope for the display of his satiric genius, and from that time forth he has continued to pursue with remarkable success this his true vein. His illustrations for Mr. William Hone's political squibs and pamphlets attracted much attention, and sent some of them through no less than fifty editions. But these political caricatures, many of which were personal, were not altogether to C.'s taste. Nor, indeed, in this narrow party field did he find verge enough for the full exhibition of his rich fund of humor and depth of moral sarcasm. He consequently abandoned this style about 1824. In *Points of Humor*, and the designs for *Grimm's German Tales*, *Tom Thumb*, *Peter Schlemihl*, *Punch and Judy*, *My Sketch-book*, *Box*, *Oliver Twist*, and the *Comic Almanac*, his comic genius first found ample manifestation; while in his *Sunday in London*, his *Gin-shop*, *The Upas Tree*, and especially *The Bottle*, he showed himself a moral teacher possessed of a grim Hogarthian earnestness and force. *The Bottle* consisted of a series of eight large-sized plates representing the various stages in a drunkard's career; and through the instrumentality of the temperance societies, as well as on account of its own merits, the work has had an enormous circulation. C. latterly devoted himself to oil-painting; and in his pictures, "Dressing for the Day," "A Runaway Knock," "Tam o' Shanter," and "Disturbing the Congregation," he combines humor and artistic skill. To these may be added the "Fairy Ring," and the "Merry Wives of Windsor." His latest production in oil-painting was a large picture, "The Worship of Bacchus." The list of his works amounts to 5,500. He died 1st Feb. 1878.

CRUIKSHANK, or **CRUICKSHANKS**, WILLIAM, 1745–1800; a Scotch anatomist, author of a number of medical works, the most valuable of which is one on *Insensible Perspiration*.

CRUISER is a swift war-vessel, employed chiefly in watching an enemy by sailing about in a suspected latitude, or in any other defined portion of sea.

CRUITHNE (Lat. *Cruithnii*, *Cruthins*), the name given, from the 6th to the 9th c., to a people who inhabited the southern half of the co. of Antrim, and the greater part of the co. of Down, and at one time established themselves also in the co. of Meath, in Ireland. They were otherwise called Dalaradians, and their country, Dalaradia. Their name of C. is supposed to be derived from the Celtic *cruit*, color, and to have been applied to them because they painted or tattooed their skins. It is the name by which the Irish called the Picts of Britain, of whom, indeed, the Irish C. are believed to have been a branch. See DALARADIA and PICTS.

CRUIVES AND ZAIRES are contrivances erected upon rivers in Scotland for the purpose of catching salmon. They are of great antiquity, and consisted of a "kind of hedge formed by stakes driven into the ground, the interstices being filled with brush, and the

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mode of capturing salmon being similar to those employed by bag and stake nets;" the earliest statute now in force, the 11th of the first parliament of James I. (1424), being entitled, "Of Cruives, Zaires, and Satterdaies Slop." This act is interpreted by 1477, c. 73, "Anent cruives," and both acts refer to an "old statute made by king David," requiring that "ilk heck of the foresaidis cruves be three inch wide." The existing arrangement, by which the stakes or hecks which prevent the passage of the larger fish must be so far apart as to permit the young salmon or fry to pass through freely, is thus as old as the time of the great founder of our Scottish monasteries and cathedrals. The Saturday's slop or opening is effected by drawing up the hecks to the height of an ell from the bottom of the river, in which position they must remain from Saturday evening at sunset till Monday morning at sunrise. C. and Z. are prohibited in those parts of a river in which the tide ebbs and flows. The fisheries act of 1862 left the law regarding C. untouched. See SALMON.

CRUSADE, CHILDREN'S. One of the strange spasmodic fevers of the middle ages. In 1212, a peasant boy in France began to preach a crusade of boys only. Although strong measures were taken to suppress the movement, it went on; and it is stated that more than 30,000 boys embarked at Marseilles for the holy land, expecting miraculous aid in reaching Palestine and converting the Moslems. By shipwreck and capture and sale into slavery, the venture came to a disastrous end. Two similar crusades, each of 20,000 children, were undertaken in Germany; one army crossing the Alps at Mont Cenis, and the other at a more westerly point. All ended miserably.

CRUSADES is the name given to the religious wars carried on during the middle ages between the Christian nations of the west and the Mohammedans. The first of these was undertaken simply to vindicate the *right* of Christian pilgrims to visit the holy sepulchre. On the conquest of Palestine, however, the *object* of the C. changed, or at least enlarged, and the efforts of the subsequent crusaders were directed to the rescue of the whole land from the Saracens, who had repossessed themselves of it. From an early period in the history of the church, it was considered a pious act to make a pilgrimage to the holy sepulcher, and to visit the various spots which the Saviour had consecrated by his presence. When Palestine was conquered by the Arabs in the 7th c., that fierce but generous people respected the religious spirit of the pilgrims, and allowed them to build a church and a hospital in Jerusalem. Under the Fatimides of Egypt, who conquered Syria about 980 A.D., the position both of the native Christian residents and of the pilgrims became less favorable; but the subjugation of the country, in 1065, by brutal hordes of Seljuk Turks from the Caucasus rendered it intolerable. These barbarians, but recently converted to Mohammedanism, were nearly as ignorant of the Koran as of the Scriptures. They hardly knew their fellow-religionists, and are said to have wreaked their vengeance on the Mussulmans of Syria, as well as on the Christians. The news of their atrocities produced a deep sensation over the whole of Christendom. The first to take alarm were, naturally enough, the Byzantine monarchs. In 1073, the Greek emperor, Manuel VII., sent to supplicate the assistance of the great pope, Gregory VII., against the Turks, accompanying his petition with many expressions of profound respect for his holiness and the Latin church. Gregory—who beheld in the supplication of Manuel a grand opportunity for realizing the Catholic unity of Christendom—cordially responded; but circumstances prevented him from ever carrying the vast designs which he entertained into execution, and the idea of a crusade died gradually away. It was, however, revived by his successor, Urban II., an able and humane man, whose sympathies were kindled by the burning zeal of Peter the Hermit, a native of Amiens, in France, who had made a pilgrimage to the holy land, witnessed the cruelties perpetrated by the Turks, and was now traversing Europe, preaching everywhere to crowds in the open air, and producing the most extraordinary enthusiasm by his impassioned descriptions of how pilgrims were murdered, robbed, or beaten; how shrines and holy places were desecrated; and how nothing but greed restrained the ruffian Turks (who made the Christians pay heavy taxes for their visits to Jerusalem) from destroying the holy sepulcher, and extirpating every vestige of Christianity in the land. As soon as the feelings of Europe had been sufficiently heated, Urban openly took up the question. Two councils were held in 1095. At the second, held at Clermont, in France, a crusade was definitely resolved on. The pope himself delivered a stirring address to a vast multitude of clergy and laymen, and as he proceeded, the pent-up emotions of the crowd burst forth, and cries of *Deus vult* (God wills it) rose simultaneously from the whole audience. These words, *Deus vult*, by the injunction of Urban, were made the war-cry of the enterprise, and every one that embarked in it wore, as a badge, the sign of the cross; hence the name *crusade* (Fr. *croisade*, from Lat. *crux*, a cross).

First Crusade.—From all parts of Europe, thousands upon thousands hurried at the summons of the pope to engage in the holy war. "The most distant islands and savage countries," says William of Malmesbury, "were inspired with this ardent passion. The Welshman left his hunting, the Scotchman his fellowship with vermin, the Dane his drinking-party, the Norwegian his raw fish." It is said that in the spring of 1096, not less than 6,000,000 souls were in motion towards Palestine. This, however, must be a huge exaggeration What we do know positively is, that previous to the setting out of the great hosts of European chivalry, four armies—if disorderly and anarchic

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multitudes, the mere dregs and refuse of Christendom, deserve that name—amounting in all to 275,000 persons, had departed for Palestine. The first consisted of 20,000 foot, and was commanded by a Burgundian gentleman, Walter the Penniless. It marched through Hungary, but was cut to pieces by the natives of Bulgaria, only a few, among whom was Walter himself, escaping to Constantinople. The second, consisting of 40,000 men, women, and children, was led by Peter the Hermit. It followed the same route as its predecessor, and reached Constantinople greatly reduced. Here the two united, crossed the Bosporus, and were utterly defeated by the Turks at Nice, the capital of Bithynia. A third expedition of a similar kind, composed of 15,000 Germans, led by a priest named Gottschalk, was slaughtered or dispersed in Hungary; which also proved the grave of the *fourth*, a terrible horde, consisting of about 200,000 wretches from France, England, Flanders, and Lorraine, who had swept along through Germany, committing horrible ravages, especially against the Jews, whom they murdered without mercy. *Now*, however, the real crusaders made their appearance: the gentry, the yeomanry, and the serfs of feudal Europe, under chiefs of the first rank and renown. Six armies appeared in the field, marching separately, and at considerable intervals of time. Their respective leaders were Godfrey of Bouillon, duke of Lorraine; Hugh the Great, count of Vermandois, and brother of Philippe, king of France; Robert Curthose, duke of Normandy, the son of William the Conqueror; count Robert of Flanders; Bohemond, prince of Tarentum, son of the famous Guiscard, under whom was Tancred, the favorite hero of all the historians of the crusade; and lastly, count Raymond of Toulouse. The place of rendezvous was Constantinople. The Greek emperor, Alexius, afraid that so magnificent a host—there were in all not less than 600,000 men, exclusive of women and priests—might be induced to conquer lands for *themselves*, cajoled all the leaders, excepting Tancred and count Raymond—into solemnly acknowledging themselves his liegemen. After some time spent in feasting, the crusaders crossed into Asia Minor (accompanied by the unfortunate Peter the Hermit). Here their first step was the siege and capture of Nice, the capital of sultan Soliman, 24th June, 1097. This monarch was also defeated by Bohemond, Tancred, and Godfrey, at Dorylæum. Baldwin, brother of Godfrey, now crossed into Mesopotamia, where he obtained the principality of Edessa. After some time, the crusaders reached Syria, and laid siege to Antioch. For seven months the city held out, and the ranks of the besiegers were fearfully thinned by famine and disease. Many even brave warriors lost heart, and began to desert. Melancholy to relate, among the list of cowards was the poor enthusiast who had planned the enterprise. Peter was actually several miles on his way home when he was overtaken by the soldiers of Tancred, and brought back to undergo a public reprimand. At length, on the 3d of June, 1098, Antioch was taken, and the inhabitants were massacred by the infuriated crusaders, who were in their turn besieged by an army of 200,000 Mohammedans sent by the Persian sultan. Once more famine and pestilence did their deadly work. Multitudes also deserted, and escaping over the walls, carried the news of the sad condition of the Christians back to Europe. But again victory crowned the efforts of the besieged. On the 28th June, 1098, the Mohammedans were utterly routed, and the way to Jerusalem opened. It was on a bright summer morning (1099) that 40,000 crusaders, the miserable remnant of that vast array which two years before had laid siege to Nice, obtained their first glimpse of Jerusalem. The emotion was intense, the scene sublime. On the 15th of July, after a siege of rather more than five weeks, the grand object of the expedition was realized. Jerusalem was delivered from the hands of the infidel. Eight days after the capture of the city, Godfrey of Bouillon was unanimously elected king of Jerusalem. His kingdom, at first comprising little more than the mere city of Jerusalem, was gradually extended by conquest until it included the whole of Palestine. A language resembling Norman French was established, a code of feudal laws drawn up—Jerusalem was erected into a patriarchate, and Bethlehem into a bishopric. The best part of Asia Minor was restored to the Greek empire, while Bohemond became prince of Antioch. For nearly fifty years the three Latin principalities or kingdoms of the east—Edessa, Antioch, and Jerusalem—not only maintained themselves against the attacks of the Mohammedans of Egypt and Syria, but greatly increased in size, power, and wealth. At Jerusalem were founded the two famous orders of the Knights Hospitallers of St. John and the Knights Templars.

Second Crusade.—In 1144, the principality of Edessa was conquered by the emir of Mosul, and the Christians slaughtered. His son, Noureddin, advanced to destroy the Latin kingdoms of Syria and Palestine. Europe once more trembled with excitement. A second crusade was preached by the famous St. Bernard, abbot of Clairvaux, in Champagne; and early in 1147, two enormous armies, under the command of Louis VII., king of France, and Conrad III., emperor of Germany, marched for the Holy Land. Their united numbers were estimated at 1,200,000 fighting men. The expedition nevertheless, proved a total failure. The Greek emperor, Manuel Comnenus, was hostile; and through the treachery of his emissaries, the army of Conrad was all but destroyed by the Turks near Iconium, while that of Louis was wrecked in the defiles of the Pisidian mountains. After a vain attempt to reduce Damascus, the relics of this mighty host returned to Europe.

Third Crusade.—The death-blow, however, to the kingdom of Jerusalem, and the power of the crusaders, was given, not by Noureddin, but by Salah-Eddin, commonly

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called Saladin, a young Kurdish chief, who had made himself sultan of Egypt, and who aspired to the presidency of the Mohammedan world. He invaded Palestine, took town after town, and finally, in Oct., 1187, compelled Jerusalem itself to capitulate, after a siege of 14 days. The news of this led to a third crusade, the chiefs of which were Frederick I. (Barbarossa), emperor of Germany, Philippe Auguste, king of France, and Richard *Cœur-de-Lion*, king of England. Barbarossa took the field first in the spring of 1189, but accidentally lost his life by fever caught from bathing in the Orontes. His army, much reduced, joined the forces of the other two monarchs before Acre, which important city was immediately besieged. In vain did Saladin attempt to relieve the defenders; and after a beleaguerement of 23 months, the place surrendered. But the crusaders were not united among themselves. Philippe soon after returned to France; and Richard, after accomplishing prodigies of valor, which excited the admiration of the Saracens, concluded a treaty with Saladin, by which "the people of the west were to be at liberty to make pilgrimages to Jerusalem, exempt from the taxes which the Saracen princes had in former times imposed." This, as has been previously noticed, was *all* that had been claimed by the *first* crusaders. On the 25th of Oct., 1192, Richard set sail for Europe.

Fourth Crusade.—Crusading unfortunately now became a constituent of the papal policy; and in 1203, a fourth expedition was determined upon by pope Innocent III., although the condition of the Christians was by no means such as to call for it. It assembled at Venice; but how entirely secular crusading had become, will be seen from the fact, that the army never went to Palestine at all, but preferred to take possession of the Byzantine empire. The leader of this host of *pseudo-crusaders*, Baldwin, count of Flanders, was seated on the throne of the east in 1204, where he and his successors maintained themselves for 56 years.

Fifth Crusade.—This was commanded by Frederick II., emperor of Germany. It began in 1228, and terminated in a treaty between that monarch and the sultan of Egypt, by which Palestine was ceded to Frederick, who, after being crowned king of Jerusalem, returned to Europe, leaving his new possessions in a state of tranquillity.

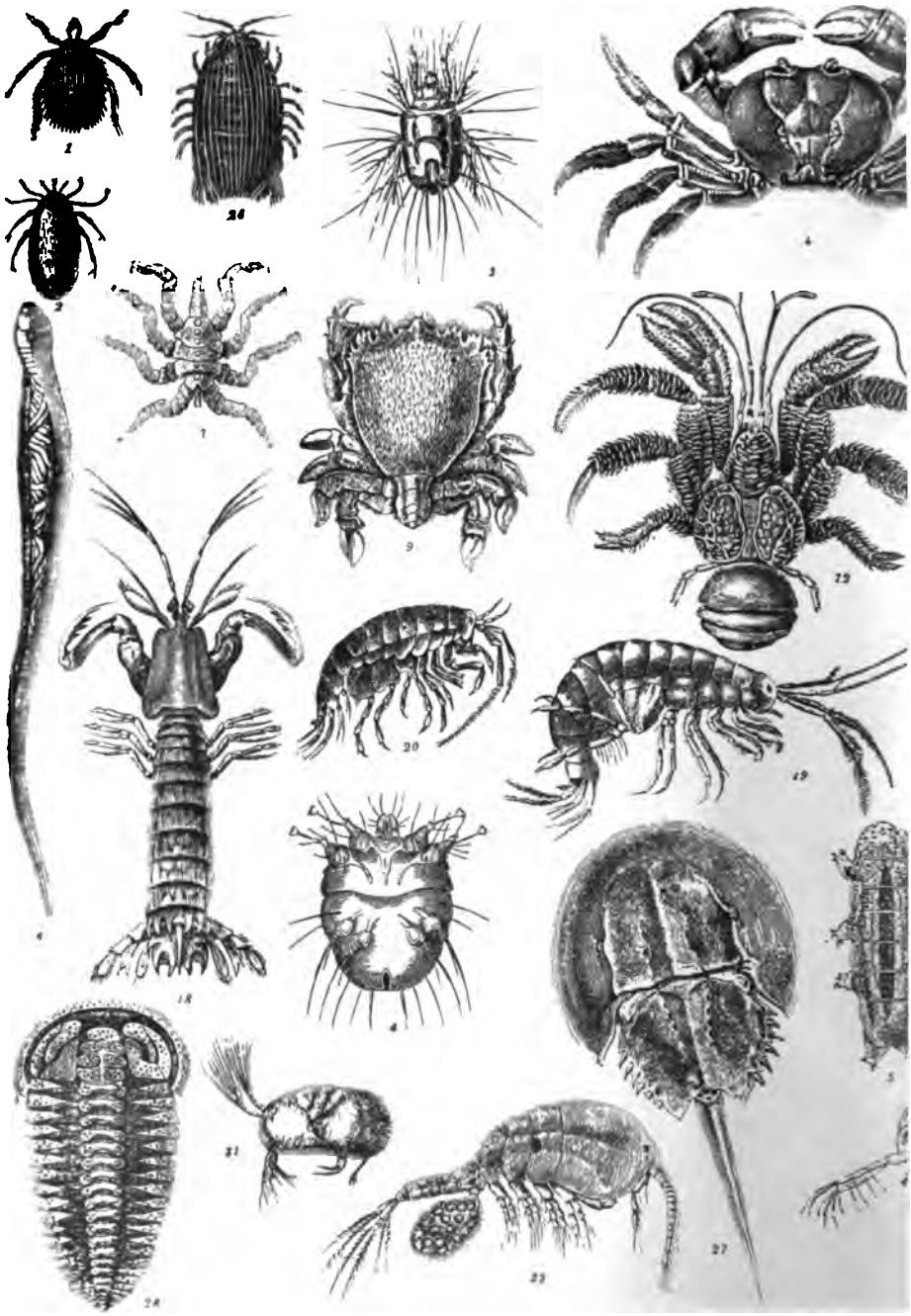
Sixth Crusade.—In 1244, a new race of Turks burst into Syria, and once more the Holy Land fell into the hands of these ferocious barbarians. Jerusalem was burned and pillaged. In 1249, Louis IX. of France (St. Louis) headed a crusade against them, but was utterly defeated, and taken prisoner by the sultan of Egypt. By the payment of a large ransom he obtained his liberty and that of the other prisoners. On his return to Europe he was regarded as a sort of martyr in the cause of Christ.

Seventh Crusade.—This also was primarily undertaken by St. Louis, but he having died at Tunis in 1270, on his way to Palestine, prince Edward of England, afterwards Edward I., who had originally intended to place himself under the command of St. Louis, marched direct for Palestine, where his rank and reputation in arms gathered round him all who were willing to fight for the cross. Nothing of consequence, however, was accomplished; and Edward soon returned to England, the last of the crusaders. Acre, Antioch, and Tripoli still continued in the possession of the Christians, and were defended for some time by the Templars and other military knights; but in 1291, Acre capitulated, the other towns soon followed its example, and the knights were glad to quit the country, and disperse themselves over Europe in quest of new employment, leaving Palestine in the undisturbed possession of the Saracens.

Effects of the Crusades.—While we cannot help deploring the enormous expenditure of human life which the C. occasioned, it is impossible to overlook the fact that they indirectly exercised a most beneficial influence on modern society. They secured for humanity certain advantages which it is difficult to see could have been otherwise obtained. M. Guizot, in his *Lectures on European Civilization*, endeavors to show their design and function in the destinies of Christendom. "To the first chroniclers," he says, "and consequently to the first crusaders, of whom they are but the expression, Mohammedans are objects only of hatred: it is evident that those who speak of them do not know them. The historians of the later crusades speak quite differently: it is clear that they look upon them no longer as monsters; that they have to a certain extent entered into their ideas; that they have lived with them; and that relations, and even a sort of sympathy, have been established between them." Thus the minds of both, but particularly of the crusaders, were partly delivered from those prejudices which are the offspring of ignorance. "A step was taken towards the enfranchisement of the human mind." Secondly, the crusaders were brought into contact with two civilizations, richer and more advanced than their own—the Greek and the Saracenic; and it is beyond all question that they were mightily struck with the wealth and comparative refinement of the east. Thirdly, the close relationship between the chief laymen of the west and the church occasioned by the C., enabled the former "to inspect more narrowly the policy and motives of the papal court." The result was very disastrous to that spirit of veneration and belief on which the church lives, and in many cases an extraordinary freedom of judgment and hardihood of opinion were induced—such as Europe had never before dreamed of. Fourthly, great social changes were brought about. A commerce between the east and west sprang up, and towns—the early homes of liberty in Europe—began to grow great and powerful. The C., indeed, "gave maritime commerce the strongest impulse it had ever received." The united effect of these

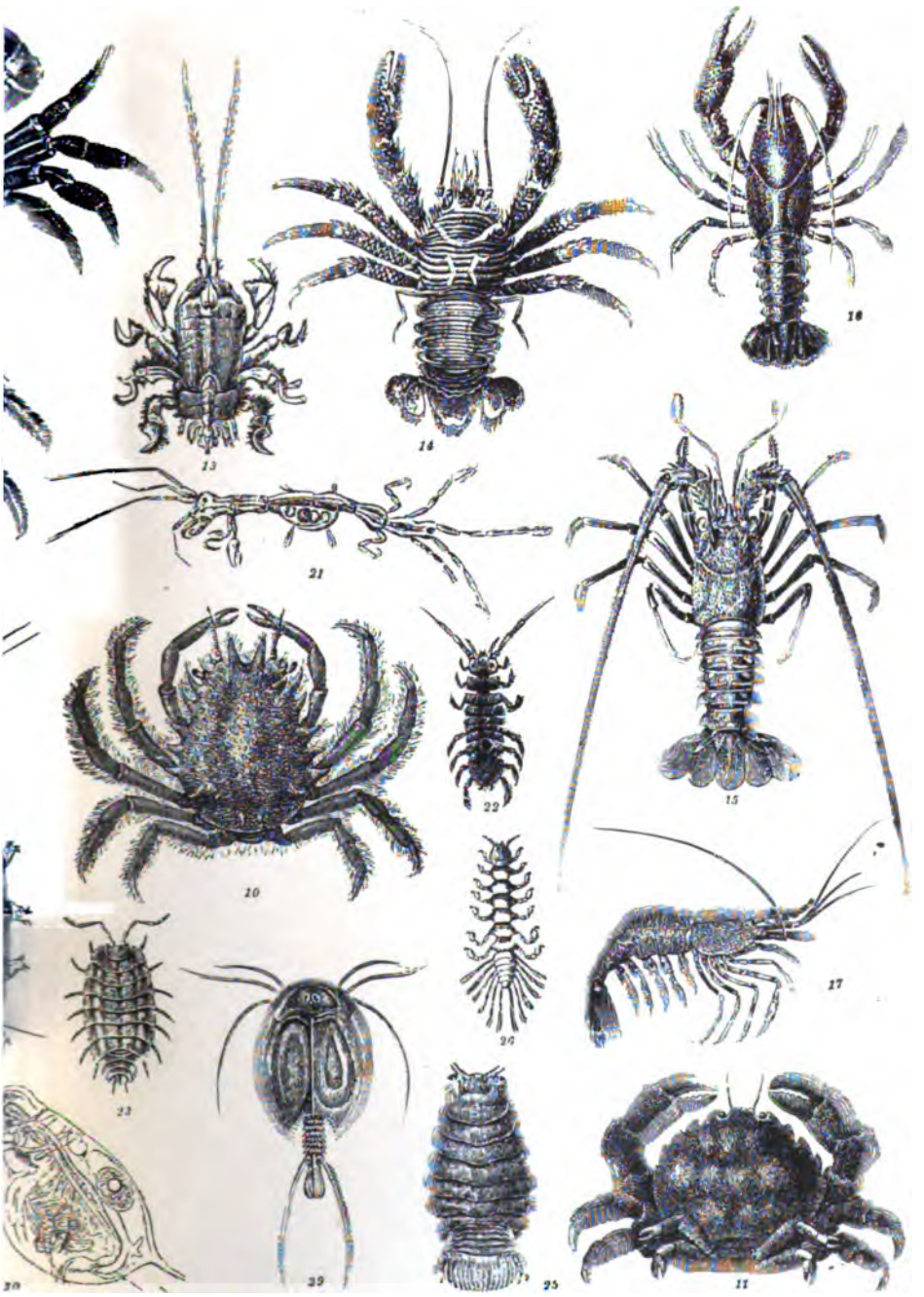
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Crustaceans, etc.—1. Grass-mite. 2. Porcupine tick. 3. Cheese-mite. 4. Itch-mi
10. Spider-crab. 11. Wool-crab. 12. Purse-crab. 13. White-bait. 14. Galathe
20. Sand-hopper. 21. Phantom-crab. 22. Fish-millepede. 23. Wood-louse. 2
28. Trilobite. 29. Shield-shrimp (*Apus cancriformis*). 30. Water-flea. 31. Cypris

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5. Bear-mite. 6. Tongue-worm. 7. Pycnogonum. 8. Land-crab. 9. Frog-crab. 15. Spiny-lobster. 16. River-crab. 17. Shrimp. 18. Locust-crab. 19. Crawfish. Pill-millepede. 25. Fish-louse. 26. Shrimp-millepede. 27. Molucca-crab (limulus). 32. Crab-flea.

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things, again, in predisposing the minds of men for a reformation in religion, has often been noticed. Other causes undoubtedly co-operated, and in a more direct and decisive manner, but the influence of the C. in procuring an audience for Luther, cannot be overlooked by the philosophic historian See Archer and Kingsford, *The Crusades* (1895).

CRUSCA, ACADEMIA DELLA. See ACADEMY.

CRU'SENSTOLPE, MAGNUS JAKOB, 1795–1865; a Swedish historian, author of *History of the Early Years of the Life of King Gustavus IV., Adolphus; The House of Holstein-Gottorp in Sweden;* and other works.

CRUSHERS, or BRUISERS, are implements used for reducing to small fragments corn, beans, linseed, oil-cake, and other similar hard food of horses, oxen, or hogs, in order that it may be more thoroughly subjected to the action of the gastric juice, and that no part of it may pass through the animal undigested. Seeds which enter the stomach with their husk or outer pellicle unbroken, often resist its powers, so that they contribute nothing to nourishment; and this is the case to a very large extent with corn given to old horses; but mastication is never so perfect, however good may be the condition of an animal's teeth, that the previous crushing of hard food will not be found useful. C. are of different kinds, and those intended for oil-cake are somewhat different from those suitable for grain; but the essential part generally consists of toothed, grooved, or otherwise roughened cylinders, revolving so as to bruise the food either against each other, or against a fixed plate of similar roughness.—CLOD-CRUSHER is the name of an agricultural implement, which may be generally described as a toothed or roughened roller.

CRU'SIUS, CHRISTIAN AUGUST, 1715–75; a German theologian, professor of theology at Leipsic. Two of the great objects of his life were to place philosophy on a thoroughly satisfactory basis for the future, and to bring philosophical conclusions into harmony with orthodox theology. His system was not successful, but it had a few enthusiastic supporters.

CRUSTA'CEANS, *Crustacea,* a class of articulated animals, agreeing with insects, arachnida, and myriapoda in having articulated limbs; but differing from them in important respects, and particularly from all of them in the adaptation of the organs of respiration to an aquatic life, even those of them which live on land being generally inhabitants of damp places, and breathing by a kind of gills. Some of the lowest and minute aquatic C., indeed, are not provided with gills; but the aëration of the blood is supposed to take place through the surface of the body.

The C. derive their name from the hard armor which in most of them covers the whole body, forming for it that sort of frame-work which is sometimes, not very correctly, called an external skeleton; and which, in those of highest organization, is very complex in its structure, and contains a large amount of calcareous matter—carbonate and phosphate of lime, so that it is in its substance intermediate between shell and bone—whilst in many of the lower and smaller kinds it consists principally of *chitine,* and corresponds more nearly in its nature with the integuments of insects. The body of a crustacean is composed of rings (see ARTICULATA), generally 21 in number, and the crustaceous covering corresponds with it in this respect; the rings, alike of the body and its armor, being in some cases very distinct, whilst in others some of them in a great measure coalesce or are consolidated together, of which the thorax of a crab affords an excellent example. The first seven rings are regarded as forming the head; the next seven, the thorax; and the remainder the abdomen, corresponding with the head, thorax, and abdomen of insects. The crustaceous covering is considered as a peculiar epidermis, having beneath it a true skin, from which it is an inorganic exudation; and, like the epidermis, it is cast off from time to time, that its place may be supplied anew, as the growth of the animal requires more room for the internal soft parts. In this *moulting,* or casting of the shell, the animal divests itself of its covering not in separate parts, but in one piece, including the coverings of the limbs, and even of the antennæ, although the membranes which connect the hard plates are split and torn. A period of apparent sickness precedes and agitation accompanies the process; and the thick muscular parts of the limbs of crabs and lobsters become soft and flaccid, so as to be much more easily extricated from their hard coverings. The loss of a limb, which sometimes takes place on such an occasion, and is otherwise a frequent occurrence, is easily repaired, for a new one grows in its stead; but it is a curious circumstance that in order to this reproduction, the limb must be broken off at a particular joint, the second from the body, thus leaving only a short stump; and when a limb is broken elsewhere, the animal itself exercises the remarkable power of throwing it off by this joint.

The principal organ of locomotion in many C., as in the lobster, shrimp, etc., is the abdomen, terminating in fan-like appendages; by bending the abdomen suddenly down under the thorax, they dart *backwards* in the water. The limbs—which are connected with the thoracic rings—are, in some, organs of swimming; those of others are used for walking at the bottom of the water or on dry ground. Some have what are called *false legs* or *pro-legs* attached to the abdomen, often very different from the thoracic legs. The legs of some are fitted for burrowing. The first pair of legs is not unfrequently transformed into a pair of powerful claws or pincers—the last joint but one being pro-

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longed so as to oppose the last joint, which becomes attached as to the side of it; and these are used for seizing and tearing food. The limbs of the first thoracic rings are, in many C., organs still more intimately connected with the mouth, and have received the name of foot-jaws, the transition from the true mandibles and maxillæ to the organs of locomotion being often very gradual. The mouth of some small parasitic C. is, however, formed for sucking, and not for tearing and masticating food. The digestive organs are very simple in all; there is a short but capacious gullet, a large stomach, and a straight and simply intestinal tube. The pyloric region of the stomach, however, is furnished with a remarkable apparatus of hard tubercles or sharp teeth for grinding or tearing food, supplementary to the external organs of the mouth. Almost all of the C. feed on animal food, and they are very voracious. A few feed on vegetable food. The nervous system of C. agrees generally with that of insects, and exhibits many gradations of division and concentration. C. in general, appear to possess all the five senses. Their eyes are either simple (stemmatic), aggregate (consisting of several stemmata under a common cornea), or compound. The compound eyes are often on foot-stalks. The gills are variously placed; in the internal cavity, under the *carapace*—the enlargement of the plate of a single ring, which covers the thoracic rings in crabs, etc.; on the thoracic limbs; on the abdominal or false legs, etc. The heart is always in the middle line of the body, is of various form, and distributes the blood by a number of trunks through the system; but the blood returns to venous *sinuses*, from which, and not from the heart, it is sent into the gills, and it is not until after its aëration in the gills that it comes to the heart again; not, however, without being mixed with venous blood which has not undergone the same aëration. The sexes are distinct in most of the C.; and they are all oviparous. A sort of incubation of the eggs takes place, in order to which they are carried under the abdomen or under the thorax of the female, attached to the false legs or to some of the thoracic appendages. It has recently been discovered, contrary to former belief, that C.—or at least many of them—undergo metamorphoses; and the curious creatures known by the name *zoea* have been found to be the young of crabs.

The greater number of C. are marine: some inhabit fresh waters, running or stagnant; comparatively few are terrestrial.

Cuvier divided C. into two sections, *malacostraca* and *entomostraca;* the former section containing the orders *decapoda, stomapoda, læmodipoda, amphipoda,* and *isopoda;* the latter the *branchiopoda* and *pœcilopoda*. Another division has been more recently proposed by Milne Edwards, and very generally adopted into *xyphosura* (the genus *limulus* alone), having a mouth destitute of jaws, and for which legs perform the office of jaws; *maxillosa,* or masticating C.; and *edentata,* or suctorial crustaceans.

CRUST OF THE EARTH. It having once been believed by geologists that the interior of our globe is in a state of fusion from heat, they have given the name of crust of the earth to the external solid covering. Man has been able to penetrate but a short way into the crust, and he cannot safely reason on his observations made at or near the surface, regarding the condition of the crust to a greater depth than a few miles, at the most 10—all beyond is little more than guess-work. The materials of the crust are not thrown confusedly together, but distinct mineral masses are found to occupy definite spaces, or to exhibit a certain order of arrangement. All these may be classified in reference either to their origin, which is aqueous (see AQUEOUS ROCKS) or igneous (q.v.); or to their relative age, as primary (q.v.), secondary (q.v.), and tertiary (q.v.).

CRUVEILHIER, JEAN, 1791–1874; a French anatomist educated in the university of Paris, where he became professor of anatomy, on which science he published three works. He was commander of the legion of honor.

CRUVELLI, SOPHIE, Baroness Vizier, b. 1826; a German singer, having a soprano voice of great strength and purity, and in her day the most popular of vocalists. On marrying baron Vizier, in 1856, she left the stage.

CRUYS, CORNELIS, the founder of Russian maritime power, was b. June 14, 1657. He was a rear-admiral in the Dutch service when czar Peter the Great, noticing his abilities, pursuaded him to go to Moscow. There he arrived Oct. 15, 1698, and was received with great splendor, and soon appointed vice-admiral. His services to Russia were of various kinds; to him it owed its first dockyards, canals, and charts, the organization of its navy, and its victories over Sweden and Turkey in 1708–1710. After a short period of disgrace, C. was received back to favor. He died in 1727, possessor of an imperial domain in Kexholm, and owner of the island Birken in Finland. It is in memory of him the white flag with the blue cross (Dutch, *kruis*) still floats from the Russian men-of-war.

CRY'OLITE is a double fluoride of aluminium and sodium (NaF,Al_2F_3), and is important as a source of the metal aluminium (q.v.).

CRYOPH'ORUS (Gr. *kryos,* cold, and *phero,* I carry) is an instrument consisting of a glass tube with a bulb at both ends. A little water is present in one of the bulbs, and when the second bulb, containing only water-vapor, is placed in a freezing mixture, the vapor condenses, which causes more vapor to rise from the water in the first bulb. The

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result of this vaporation from the first bulb is the abstraction of much heat, and ultimately the remaining water passes into a frozen state.

CRYPT (Gr. *krypto*, I hide), a vault under a church, either entirely or partly under ground. Crypts do not generally extend beyond the limits of the choir or chancel, and they are often of much smaller dimensions. Crypts were formerly used as chapels, and provided with altars and the other furniture requisite for the celebration of religious services; and they were also very frequently used as places of sepulture. It sometimes happens that a new church has been erected over the C. belonging to the old one. One of the largest crypts in England is that under Canterbury cathedral; but there are few finer specimens of the C. any where than that under Glasgow cathedral, which has been recently freed from rubbish and restored. Crypts seem to have originated in the customs of the early Christian ages. The tombs of the martyrs were first used as churches; and then churches were built above them.

CRYPTO-CALVINISTS, a name given to Melanchthon and those who agreed with him in wishing to unite the Lutherans and Calvinists, and especially in his supposed leaning towards the Calvinistic view of the Lord's Supper as shown in the difference between the original and the altered Augsburg confession. The former said: "The body and blood of Christ are truly present in the Lord's supper in the form of bread and wine, and are there distributed and received by the communicants: therefore the opposite doctrine is rejected." In the latter, the last clause is omitted. Luther did not approve the alteration, but tolerated Melanchthon's change of doctrine. Many, however, called him a Crypto-Calvinist. The truth seems to have been that he did not consider that either opinion was a sufficient bar to communion with Christ, and therefore thought that both of them ought to be allowed. The controversy was becoming violent before his death, but afterwards it broke out with great virulence, and continued with alternate success on each side for 50 years; during which time frequent attempts were made to suppress the Calvinistic opinions by imprisoning their leading advocates, and, at last, in 1611, by the execution of chancellor Nicolas Crell.

CRYPTOGAMOUS PLANTS (Gr. *kryptos*, concealed, and *gamē*, marriage) are those which have no true flowers, and no known male or female organs of fructification, and whose seeds, called *spores*, consist only of a single cell, and contain no embryo, but germinate indifferently from any point; and which Jussieu therefore designated *acotyledonous plants* (q.v.). The name C. P. was invented by Linnæus, and the *cryptogamia* form a class of his sexual system, very distinct from all the rest. See BOTANY. Many C.P. have no leaves; some have not even a root, and those which are lowest in organization consist only of a single cell. Many are parasitic. Many look as if dead in a dry atmosphere, and are revivified by rain. They are the lowest in organization of the vegetable kingdom, and are divided into *filices* (ferns), *marsileaceæ*, *lycopodiaceæ* (club-mosses), *equisetaceæ* (horse-tails), *musci* (mosses), *hepaticæ*, *lichens*, *fungi*, *characeæ*, and *algæ*.

CRYPTOGRAPHY, the art of secret writing, more commonly called the art of writing in cipher (from Arabic *sifr*, void), has been in use from an early date in correspondence between diplomatists and others engaged in important affairs requiring secrecy. In modern times, it has been the subject of learned care to lord Bacon, the ingenious marquis of Worcester, Dr. Wallis, bishop Wilkins, Thicknesse, Falconer, Blair, etc. In our own history, it has at no time been in greater requisition than during the civil war, and among the politicians of the 17th century. And even now, when there is happily less need for mystery among our statesmen, the need for a perfectly undecipherable mode of secret communication has again had to be looked for, in order that information may pass by the electric telegraph without being understood by the officials in connection with the apparatus.

One of the most simple methods of C. is to use, instead of each letter of the alphabet, a certain other letter at a regular interval in advance of it in that series. Such was a mode of secret writing used by Julius Cæsar. As a variety upon this plan, the alphabet is used invertedly—*z* for *a*, *y* for *b*, *x* for *c*, and so on. Or while the first seven letters are represented by the second seven, the next six may be represented by the last six. And many other variations may be adopted. But for all modes like these, there are modes of decipherment far from difficult. It is only necessary, in general, to bear in mind certain peculiarities of the language presumed to be used. Say it is the English. We readily remember that *e* is the most frequent letter; that *ea* and *ou* are the double vowels which most frequently occur; that the consonants most common at the ends of words are *r*, *s*, and *t*; etc. We also know how a single letter must be either the pronoun *I* or the article *a*; how *an*, *at*, and *on* are the most common words in two letters; how *the* and *and* are the most frequent words in three letters, etc. By taking advantage of these few obvious principles, a tolerably skilled decipherer will read almost any such piece of cryptographic writing in five minutes. The *Times* newspaper often gives, in its advertising columns, correspondence on delicate subjects, even assignations for elopements, written in this manner, the writers of which are of course little aware how open their secrets thus become to society.

Politicians and important personages conducting affairs of difficulty became long ago sensible of the necessity of using ciphers of greater abstruseness. The celebrated letter of Charles I. to the earl of Glamorgan, in which he made some condemning con-

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cessions (elsewhere denied) to the Catholics of Ireland, was composed in an alphabet of 24 short strokes variously situated upon a line. Other letters by the same monarch are to appearance a mere series of numbers of two and three figures, divided by semicolons. In such cases, it was necessary that the two parties in the correspondence should have previously concerted what words each number was to represent. Bacon devised what he thought a not easily penetrable cipher, in which he employed only *a* and *b*, arranging each of these in groups of 5, in such collocations as to represent all the 24 letters. Thus, *aabab ababa babba* conveyed the word *fly*. The great philosopher thought that preconcertment would here be necessary; but in reality any clever modern decipherer would have found no difficulty in reading any long letter composed in such a manner The unfortunate earl of Argyle, when preparing his expedition against the tyrannical government of James II., used a mode of secret writing which consisted in setting down the words at certain intervals, which he afterwards filled up with other words, making on the whole something intelligible, but indifferent. In our day, such a mode would not have been found proof against the ingenuity of those who have studied the means of decipherment. There are many other modes of secret writing, which it does not seem necessary to detail, as the art has become little more than a matter of curiosity. One of the ablest and amplest treatments of the subject is an article by Dr. William Blair in *Rees's Cyclopædia*. The fact that Francis Bacon was interested in cryptography may have suggested to Mr. Ignatius Donnelly his theory that the Shakespearian plays contain a cipher which, if properly interpreted, would show Bacon to have been their author. This theory of the Baconian authorship is set forth by Mr. Donnelly in his work *The Great Cryptogram* (1888), but is not generally accepted. Such modes of communication have been in use from the earliest times. The Lacedæmonians, according to Plutarch, had a method which has been called the scytale, from the staff employed in constructing and deciphering the message. When the Spartan ephors wished to forward their orders to their commander abroad, they wound slantwise a narrow slip of parchment upon the staff so that the edges met close together, and the message was then added in such a way that the centre of the line of writing was on the edge of parchment. When unwound, the scroll consisted of broken letters; and in that condition it was dispatched to its destination; the general to whose hands it came deciphering it by means of a staff exactly corresponding to that used by the ephors. Polybius has enumerated other methods of cryptography. The art was in use also among the Romans. Upon the revival of letters, methods of secret correspondence were introduced into private business, diplomacy, plots, etc.; and as the study of this art has always presented attractions to the ingenious, a curious body of literature has been the result. John Trithemius, the abbot of Spanheim, was the first important writer on cryptography. His *Poligraphia*, published in 1500, has passed through many editions, and has supplied the basis upon which subsequent writers have worked. It was begun at the desire of the duke of Bavaria; but Trithemius did not at first intend to publish it, on the ground that it would be injurious to public interests. The next treatises of importance were those of John Baptist Porta, a Neapolitan mathematician, who wrote *De Furtivis Literarum Notis*, 1563; and of Blaise de Vigenere, whose *Traité des Chiffres* appeared in Paris in 1587. Lord Verulam proposed an ingenious system of cryptography on the plan of what is called the double cipher; but while thus lending to the art the influence of his great name, he gave an intimation as to the general opinion formed of it and as to the classes of men who used it; for when prosecuting the earl of Somerset in the matter of the poisoning of Overbury, he urged it as an aggravation of the crime that the earl and Overbury "had ciphers and jargons for the king and queen and all the great men—things seldom used but either by princes and their ambassadors and ministers, or by such as work or practice against or, at least, upon princes." Other eminent Englishmen were afterwards connected with the art. John Wilkins, subsequently bishop of Chester, published in 1641 an anonymous treatise entitled *Mercury, or The Secret and Swift Messenger*, a small but comprehensive work on the subject, and a timely gift to the diplomatists and leaders of the civil war. The deciphering of many of the royalist papers of that period, such as the letters that fell into the hands of the parliament at the battle of Naseby, has by Henry Stubbe been charged on the celebrated mathematician, Dr. John Wallis, whose connection with the subject of cipher-writing is referred to in the Oxford edition of his mathematical works, 1689; as also by John Davys. Dr. Wallis states that this art, formerly scarcely known to any but the secretaries of princes, etc., had grown very common and familiar during the civil commotion, "so that now there is scarcely a person of quality but is more or less acquainted with it, and doth, as there is occasion, make use of it." Subsequent writers on the subject are John Falconer, *Cryptomenysis Patefacta*, 1685; John Davys, *An Essay on the Art of Deciphering in which is inserted a Discourse of Dr. Wallis*, 1737; Philip Thicknesse, *A Treatise on the Art of Deciphering and of Writing in Cipher*, 1772; William Blair (the writer of the comprehensive article "Cipher" in Rees's Cyclopædia), 1819; and C. von Marten, *Cours Diplomatique*, 1801, a fourth edition of which appeared in 1851. Perhaps the best modern work on this subject is the *Kryptographik* of J. L. Kluber, who was drawn into the investigation by inclination and official circumstances. In this work the different methods of cryptography are classified. Amongst others of less merit who have treated on this art, may be named Gustavus Selenus (i.e. Augustus, duke of Brunswick), 1624; Cospi, translated by Niceron in 1641; the marquis of Worces-

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ter, 1659; Kircher, 1663; Schoot, 1665; Hiller, 1682; Comiers, 1690, Baring, 1737; Conrad, 1739, etc.

Schemes of cryptography are endless in their variety. Bacon lays down the following as the "virtues" to be looked for in them: "that they be not laborious to write and read; that they be impossible to decipher; and, in some cases, that they be without suspicion." The principles are more or less disregarded by all the modes that have been advanced, including that of Bacon himself, which has been unduly extolled by his admirers as "one of the most ingenious methods of writing in cipher, and the most difficult to be deciphered, of any yet contrived."

The simplest and commonest of all ciphers is that in which the writer selects in place of the proper letters certain other letters in regular advance. This method of transposition was used by Julius Cæsar. He, "per quartam elementorum literam," wrote *d* for *a*, *e* for *b*, and so on. There are instances of this arrangement in the Jewish rabbis, and even in the sacred writers. An illustration of it occurs, Jeremiah xxv. 26, where the prophet, to conceal the meaning of his prediction from all but the initiated, writes Shehach instead of Babel (Babylon), the place meant: i.e., in place of using the second and twelfth letters of the Hebrew alphabet (*B*, *b*, *l*), counting from the beginning, he wrote the second and twelfth (*sh*, *sh*, *ch*), counting from the end. To this kind of cipher-writing Buxtorf gives the name Athbash (from *a*, the first letter of the Hebrew alphabet, and *th* the last; *b*, the second from the beginning, and *h*, the second from the end). Another Jewish cabalism of like nature was called Albam; of which an example is in Isaiah vii. 6, where Tabeal is written for Remaliah. In its adaptation to English this method of transposition, of which there are many modifications, is comparatively easy to decipher. A rough key may be derived from an examination of the respective quantities of letters in a type-founder's bill, or a printer's "case." The decipherer's first business is to classify the letters of the secret message in the order of their frequency. The letter that occurs oftenest is *e;* and the next in order of frequency is *t*. The following groups come after these, separated from each other by degrees of decreasing recurrence: *a, o, n, i, r, s, h;* *d, l;* *c, w, u, m;* *f, y, g, p, b;* *v, k, x, q, j, z*. All the single letters must be *a*, *I*, or *O*. Letters occurring together are *ee, oo, ff, ll, ss*, etc. The commonest words of two letters are (roughly arranged in the order of their frequency) *of, to, in, it, is, be, he, by, or, as, at, an, so*, etc. The commonest words of three letters are *the* and *and* (in great excess), *for, are, but, not*, etc.; and of four letters: *that, with, from, have, this, they*, etc. Familiarity with the composition of the language will suggest numerous other points of value to the decipherer. He may obtain other hints from Poe's tale called *The Gold Bug*. As to messages in the continental languages constructed upon this system of transposition, rules for deciphering may be derived from Breithaupt's *Ars Decifratoria*, 1737, and other treatises.

Bacon remarks that though ciphers were commonly in letters and alphabets, yet they might be in words. Upon this basis codes have been constructed, classified with words taken from dictionaries being made to represent complete ideas. In recent years such codes have been adapted by merchants and others to communications by telegraph, and have served the purpose not only of keeping business affairs private, but also of reducing the excessive cost of telegraphic messages to distant markets. Obviously this class of ciphers present greater difficulties to the skill of the decipherer. Figures and other characters have been also used as letters; and with them ranges of numerals have been combined as the representatives of syllables, parts of words, words themselves, and complete phrases. Under this head must be placed the dispatches of Giovanni Michael, the Venetian ambassador to England in the reign of queen Mary, documents which have only of late years been deciphered. Many of the private letters and papers from the pen of Charles I. and his queen, who were adepts in the use of ciphers, are of the same description. One of that monarch's letters, a document of considerable interest, consisting entirely of numerals purposely complicated, was in 1858 deciphered by prof. Wheatstone, the inventor of the ingenious crypto-machine, and printed by the Philobiblon society. Other letters of like character have been published in the *First Report of the Royal Commission on Historical Manuscripts*. In the second and subsequent reports of the same commission, several keys to ciphers have been catalogued, which seem to refer themselves to the methods of cryptography under notice. In this connection also should be mentioned the "characters" which the diarist Pepys drew up when clerk to sir George Downing and secretary to the earl of Sandwich and to the admiralty, and which are frequently mentioned in his journal. Pepys described one of them as "a great large character," over which he spent much time, but which was at length finished, 25th April, 1660; "it being, says he, "very handsomely done and a very good one in itself, but that not truly alphabetical."

Shorthand marks and other arbitrary characters have also been largely imported into cryptographic systems to represent both letters and words—commonly the latter. This plan is said to have been first put into use by the old Roman poet Ennius. It forms the basis of the method of Cicero's freedman, Tiro, who seems to have systematized the labors of his predecessors. A large quantity of these characters have been engraved in Gruter's Inscriptiones. The correspondence of Charlemagne was in part made upon marks of this nature. In Rees's Cyclopædia, specimens were engraved of the cipher used by cardinal Wolsey at the court of Vienna in 1524, of that used by sir Thomas

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Smith at Paris in 1563, and of that of sir Edward Stafford at Madrid in 1586; in all of which arbitrary marks are introduced. The first English system of shorthand—Bright's *Characterie*, 1588—almost belongs in the same category of ciphers. A favorite system of Charles I., used by him during the year 1646, was made up of an alphabet of twenty-four letters, which were represented by four simple strokes varied in length, slope, and position. This alphabet is engraved in Clive's *Linear System of Shorthand*, 1830, having been found amongst the royal manuscripts in the British museum. An interest attached to this cipher from the fact that it was employed in the well-known letter addressed by the king to the earl of Glamorgan, in which the former made concessions to the Roman Catholics of Ireland.

Complications have been introduced into ciphers by the employment of "dummy" letters—"nulls and insignificants," as Bacon terms them. Other devices have been introduced to perplex the decipherer, such as spelling words backwards, making false divisions between words, etc. The greatest security against the decipherer has been found in the use of elaborate tables of letters arranged in the form of the multiplication-table, the message being constructed by the aid of preconcerted key-words. Details of the working of these ciphers may be found in the treatises named in this article. The deciphering of them is one of the most difficult tasks. A method of this kind is explained in the Latin and English lives of Dr. John Barwick, whose correspondence with Hyde, afterwards earl of Clarendon, was carried on in cryptography. In a letter dated 20th Feb., 1659–60, Hyde, alluding to the skill of his political opponents in deciphering, says that "nobody needs to fear them" if they write carefully in good ciphers." In his next he allays his correspondent's apprehenness as to the deciphering of their letter: "I confess to you, as I am sure no copy could be gotten of any of my cyphers from hence, so I did not think it probable that they could be got on your side of the water. But I was as confident, till you tell me you believe it, that the devil himself cannot decipher a letter that is well written, or find that 100 stands for sir H. Vane. I have heard of many of the pretenders to that skill, and have spoken with some of them, but have found them all to be mountebanks; nor did I ever hear that more of the king's letters that were found at Naseby, than those which they found deciphered, or found the ciphers in which they were writ were deciphered. And I very well remember that in the volume they published there was much left in cipher which could not be understood, and which I believe they would have explained if it had been in their power."

An excellent modification of the key-word principle was constructed by the late admiral sir Francis Beaufort; it has been recently published in view of its adaptation to telegrams and post-cards. Ciphers have been constructed on the principle of altering the places of the letters without changing their powers. The message is first written Chinese-wise upward and downward, and the letters are then combined in given rows from left to right. In the celebrated cipher used by the earl of Argyle when plotting against James II., he altered the position of the words. Sentences of an indifferent nature were constructed, but the real meaning of the message was to be gathered from words placed at certain intervals. This method, which is connected with the name of Cardan, is sometimes called the trellis or card-board cipher. The wheel-cipher, which is an Italian invention, the string-cipher, the circle-cipher, and many others, are fully explained, with the necessary diagrams, in the authorities named above—more particularly by Kluber in his *Kryptographik*.

CRYSTAL ISLANDS. See CORAL ISLANDS.

CRYSTALLINE LENS. See EYE.

CRYSTALLINE ROCKS, a name given to all rocks, having a crystalline structure. They are found belonging to every division of the crust of the earth, but are especially abundant in the most ancient azoic rocks; the greater proportion of intruded igneous rocks also possess this structure. When attempting in the laboratory to produce crystals, it is known that the building material must exist in a fluid condition, and this is obtained either by heating to fusion or by solution. It has been asserted that all C. R. have been produced under similar circumstances; and no one can doubt that lavas and more ancient rocks having a similar origin, have assumed this structure while solidifying from a condition of igneous fusion, while rock-salt is as certainly obtained from a saturated solution of salt. There are, however, many rocks, such as some fossiliferous limestones, in which this structure occurs, where it is not possible to conceive of their being in either condition. It is known that crystallization takes place in solid material, as in the axles of railway carriages, or in the crystals of pyrites in the chalk, where the iron has been gathered from the surrounding material while in a solid state. We know not what is the force that induces such a change in solid materials; it may be called metamorphic or molecular action, but these are names that mean nothing, and simply hide our ignorance. That such a force, inducing crystalline structure in amorphous masses, has been and is now at work on the solid strata of the earth, cannot be doubted.

CRYSTALLOG'RAPHY. A crystal is a piece of matter that, by the action of molecular forces, has assumed a definite geometrical form of some kind, with plane faces. There is a great variety of crystalline forms, each form being characteristic of one or

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more substances; and C. is the science which classifies the forms and shows the relations that subsist among them. The great majority of substances are capable of undergoing the process of crystallization, the exceptions being principally complex organic substances which tend to assume a globular or spherical form approaching that of organized structures. The most favorable condition for the crystallization of any substance is from its solution in water or other liquid. A liquid usually dissolves more of a salt when warm than when cold; and when a warm saturated solution is allowed to cool, a portion of the salt deposits itself in crystals. This process is that which is generally followed in the crystallization of saline substances. A second process resorted to in the case of the metals, such as bismuth, antimony, etc., and sulphur, is to fuse the material in a vessel, and when it is cooled down, so as partially to solidify the mass, the crust is broken through, and the liquid still remaining is poured off, when a net-work of crystals is obtained. A third method is to vaporize the substance, which on condensation resolves itself into crystals. Examples of this class are the formation of snow crystals from the water-vapor in the atmosphere, and the minute black crystals of iodine obtained by allowing its vapor to condense in a cold vessel or on a cold surface.

Many circumstances affect the crystallizing power of substances. Thus, water may be cooled down below its freezing or crystallizing point (32° F.), provided it be kept perfectly still, without becoming solid; but on subsequent agitation, it instantly crystallizes. Similarly, a hot saturated solution of sulphate of soda, or glauber salt, if cooled down in a still place, does not crystallize, but immediately does so when the liquid is agitated, or a fragment of any solid substance is introduced into it. The size of the crystals obtainable from any fluid depends much on the rate of cooling, and the state of commotion of the liquid. The more slowly the solution cools down, and the more quietly the process of crystallization is allowed to proceed, the larger are the crystals obtained; whilst, when the liquid is rapidly cooled, and agitation is kept up, the crystals are comparatively small, and generally not completely formed. The reason of this will be at once apparent, for a large crystal is constructed of a multitude of smaller crystals, built up regularly so as to constitute a compound crystal of the same form as the more minute crystalline atoms; and when a liquid is cooled slowly in a state of rest, only a few minute crystals are produced at first, and these are gradually built round on all sides by successive layers, till large, well-defined crystals are the result; while, when the liquid is rapidly lowered in temperature, and especially when agitation is kept up, numerous minute crystals are formed at once, and do not adhere together. In either case, the liquid from which the crystals have separated is called the *mother-liquor*, and is a saturated solution of the salt.

The external forms of crystals amount to several thousands, but they may all be regarded as belonging to six different systems.

The *regular system* (otherwise called the *cubic, octohedral, tesseral, tessular, spheroidal*, or *equi-axed system*) is characterized by having three axes or straight lines passing through the same point, of equal lengths, and placed at right angles to each other. The best illustration of this system is the cube or hexahedron, which has six square faces or planes, and the three equal axes terminate in the center of each of the square faces. The planes or squares are symmetrically arranged, so that each is perpendicular to one axis, and parallel to the other two. The crystals have each six square faces, with twelve equal edges, and eight equal angles. Examples of substances which crystallize in the form of the cube or hexahedron, are—common iron pyrites, FeS_2, common salt, or the chloride of sodium, NaCl, fluor spar, CaF_2, galena, or the sulphuret of lead, PbS, and the metals gold, silver, platinum, and copper. Another important crystalline form belonging to the regular system is the octohedron, where the terminations of the axes are in the angles of the crystals. It has eight faces, all of which are equilateral triangles, and twelve edges with six angles, each of which has four faces. The diamond, alum, zinc-blende, ZnS, sal ammonia, C_2NH_4Cl, magnetic iron ore, Fe_3O_4, fluor spar, CaF_2, and chrome iron ore are examples. There are various secondary forms belonging to this system, derivable from the cube and octohedron, such as the rhombic dodecahedron, which has twelve faces, and is the form in which the garnet crystallizes.

The *square prismatic system* (known as the *pyramidal, tetragonal*, or *quadratic system*) three axes placed at right angles to each other, of which two are of equal length, but the third may be longer or shorter. To this belong the *right square prism*, in which the lateral axes terminate in the center of each side face, and the perpendicular axis, is longer than the two lateral axes; and the *right square-based octohedron*, which resembles two pyramids placed base to base, and having eight faces, which form isosceles triangles. Examples of substances which crystallize in this system are yellow prussiate of potash, native binoxide of tin, zircon, apophylite, calomel, etc.

The *right prismatic system* (otherwise known as the *right rhomboidal*, or *rectangular prismatic system*) is characterized by having three axes, all of unequal or different lengths, but placed at right angles to each other. The *right rhombic prism* and the right *rhombic-based octohedron*, are forms included in this class, and examples of materials which crystallize in this form are sulphur, arsenical iron pyrites, nitrate of potash, sulphate of potash, sulphate of baryta (heavy spar), topaz, arragonite, etc.

The *oblique prismatic system* (*oblique rhomboidal*, or *rectangular prismatic*) has three axes, which may be all of unequal lengths, two of which are placed at right angles to

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each other, whilst the third axis is so inclined as to be perpendicular to one of the two axes, and oblique to the other. To this belong the *oblique rhombic prism* and the *oblique rhombic-based octohedron*. Many salts crystallize in this form, such as green vitriol (sulphate of iron), borax, sulphate of soda, carbonate of soda, phosphate of soda, realgar (native bisulphuret of arsenic), etc.

The *doubly oblique prismatic system* has three axes of unequal length, which intersect obliquely with each other. The forms are very irregular, which render them very puzzling to make out satisfactorily. Nitrate of bismuth, sulphate of copper, sulphate of manganese, quadroxalate of potash, and pyrotartaric acid, are examples.

The *rhombohedral*, or the regular *hexagonal system*, is known by the presence of four axes, three of which are in the same plane, and inclined to each other at an angle of 60°, whilst the remaining fourth axis is perpendicular to the three. To this belong the *regular six-sided prism* and the *rhombohedron*. Examples of this system are calcareous spar, ice, quartz or rock crystal, nitrate of soda, beryl, arsenic, antimony, and apatite. MICROSCOPIC PICTURES, vol. IX.

CRYSTALLO'MANCY, a mode of divination by means of transparent bodies, at one time very popular. A precious stone, crystal globe, or other transparent object, was employed, but a beryl was deemed most effective. In using it, the operator first muttered over it certain formulas of prayer, and then gave it into the hands of a youth or virgin—none others were pure enough to discern its revelations—who beheld in it the information required. Sometimes the desiderated facts were conveyed by means of written characters on the crystal; sometimes the spirits invoked appeared in the crystal to answer the questions asked.

CRYSTAL PALACE, the edifice in London in which the world's fair was held in 1851, designed by sir Joseph Paxton, and built chiefly of glass and iron, with floors of wood. Its length was 1851 ft.; its area 21 acres. The visitors numbered more than 6,000,000. A permanent structure of this kind was built, 1854, at Sydenham, 8 m. from London. Its cost was £1,450,000; and in its vast collections all departments of art and science were represented. A crystal palace on a smaller scale, erected in New York, 1853, was used for exhibitions and great concerts; but was destroyed by fire in 1858.

CRYSTAL WEDDING. See WEDDING ANNIVERSARIES.

CSAB'A, a t. of Hungary, 7 m. s.s.w. of Bekes. It is well built; some of the houses are even very elegant. It has a trade in grain, wine, and cattle. The women are also noted for their skill in making sacks and mattresses. Pop. of township (1890) 34,243.

CSÁRDÁS, Hungarian national dance, in common time and of two movements, andante and allegro. Its accents fall on the weak beats of the bar, a peculiarity of Hungarian music. The Csárdás is danced by the gypsies.

CSAT, or CSATH (MEZO), a market-t. of Hungary, near the Theiss, in the district Borsod, and about 15 m. s.e. of Miskolcz. Pop. '90, 5200

CSERVEN'KA, a t. of Hungary, in the co. of Upper Bacs, on the Franzens canal, about 130 m. s. of Pesth. Pop., which is German (1890), 7429.

CSO'KONAI, MIHALY VITEZ, 1773–1805; a Hungarian poet, educated in Debrecsin, and while very young appointed to the professorship of poetry. He was soon deprived of the place because of his immoral habits. He died after a dozen years of wretched existence. His works have been published.

CSOMA DE KÖRÖS, ALEXANDER, a Hungarian scholar and traveler, whose name in his own language is written Körõse Csoma Sandor, was b. Apr. 4, 1784, at Körös in Transylvania, and educated first at the college of Nagy-Enyed, and subsequently at Göttingen, where he devoted himself with great zeal to the study of the oriental tongues. The dream and inspiration of his boyhood was the hope of one day discovering the original home of his Magyar ancestors; and as he grew up, it became the single thought and passion of his life. In 1820, he set out on his visionary pilgrimage. After a year's interval, his friends got a letter from him, dated Tcheran, in which he expressed his conviction that the object of his search would speedily be obtained. Leaving Teheran, he wandered n.e. through Little Bokhara, and at length reached Thibet, where he spent about four years (1827–30) in the Buddhist monastery of Kanam, studying Thibetan. He soon discovered that there was little connection between that language and his native one, but still he hoped to make use of his researches, and set out for Calcutta. Here he learned, to his dismay, that the literature of Thibet was simply a translation from the Sanscrit—a language he might easily have acquired a knowledge of at home. His whole labor seemed to have been in vain. Fortunately for C. de K., the library of the Asiatic society of Bengal contained upwards of 1000 volumes in Thibetan which no one could catalogue. C. de K. undertook and successfully executed the task. By the great Anglo-Indian scholars, Prinsep, Wilson, and others, he was very generously treated. He next prepared, at the expense of the government, a Thibetan grammar and dictionary (Calcutta, 1834), which was the first really accurate and valuable European work on the subject. It is still a standard treatise, and has been the guide of all good scholars since. C. de K. wrote many articles on Thibetan literature in the *Asiatic Researches*, but still

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haunted, as of old, by the hope of discovering the early home of the Magyars, he once more set out on an expedition to the western confines of China, but died on the 11th April, 1842, at Darjeeling, a sanitary station for the British troops in Sikkim, 318 m. n. of Calcutta.

CSON'GRAD, a co. in Hungary, intersected by the Theiss; 1280 sq. m.; pop. '90, 262,774. It is level, with a fertile soil, producing wheat, corn, hemp, tobacco, and fruits. Chief town, Szegedin.

CSON'GRAD, a market t. of Hungary, situated on a neck of land at the confluence of the Theiss and the Körös, 70 m. s.e. of Pesth. The inhabitants (1890), 20,800 in number, are chiefly engaged in the rearing of cattle and the cultivation of the vine.

CTEN'OID FISHES, an order of fishes, according to a classification proposed by Agassiz (see FISHES), characterized by *ctenoid* scales, i.e., imbricated scales, generally rounded or ovoid, with teeth or sharp projections on their hinder margin. The name is from the Greek *kteis* (gen. *ktenos*), a comb. The scales of C. F. are horny or bony and unenameled. There are sometimes numerous rows of teeth or little spines, sometimes only one row, the rows successively wearing off as new ones are formed in the enlargement of the scale. Living C. F. are numerous, fossil ones comparatively few. Perches, flounders, and turbot may be mentioned as examples.

CTENOPH'ORÆ, jelly fishes, of which about 70 species are enumerated by Agassiz. He says: "When active it hangs out a pair of most remarkable appendages, the structure and length and contractility of which are equally surprising, and exceed in wonderful adaptation all I have ever known among animal structures. Two apparently simple and irregular threads hang out from the opposite side of the sphere. Presently these appendages may elongate, and equal in length the diameter of the sphere, or surpass it, and increase to 2, 3, 4, 5, 10, and 25 times the diameter of the body, and more and more; so much so, that it would seem as if these threads had the power of endless extension and development. But as they lengthen they appear more complicated; from one of their sides, other delicate threads shoot out like fringes, forming a row of beards like that of the most elegant ostrich feather, and each one of these threads itself elongates until it equals in length the diameter of the whole body, and bends in the most graceful curves." A common species on the Atlantic coast is of a beautiful rose color, reaching a length of 3 or 4 in., and often so plentiful as to tinge large spaces in the sea with a rosy hue.

CTE'SIAS, a Greek physician and historian of the 5th c. B.C., author of a number of books, among which were histories of which abridgments are extant. The most important of his books was a history of Persia, but it is now generally discredited.

CTESIB'IUS, a Greek who lived about 250 years B.C., was b. at Alexandria, and was famous for his inventions in mechanics. We owe to him and his pupil Hero Alexandrinus, the pump, the bent siphon, and also the discovery of the elastic force of air, and its application as a motive power.

CTESIPHON, now Al-Madain, was a city of Assyria, on the eastern bank of the Tigris, the common winter residence of the Parthian kings, and finally the capital of the Parthian kingdom. Its ruins still attest its former magnificence.

CTESIPHON, an Athenian orator in the 4th c. B.C. He proposed the presentation of a golden crown to Demosthenes for his sacrifices in his country's cause.

CUBA, the largest and most westerly island of the West Indies, and the most important American possession of Spain, lies at the entrance of the Gulf of Mexico, stretching from lat. 19° 50′ to 23° 9′ n. and from long. 74° 8′ to 84° 58′ w. It is about 759 miles long and from 90 to 27 miles broad; has a coast line of 1976 miles, and, excluding adjacent islands, an area of about 45,000 sq.m., or a little less than that of Pennsylvania. Of this, seven per cent. is unreclaimed and four per cent. is under forests, while large tracts are still unexplored.

History.—The "Pearl," or "Queen of the Antilles," the "Ever-faithful Isle," as the Spaniards term it, was discovered by Columbus on his first voyage and on Oct. 28, 1492. He landed, it is supposed, on the north coast, near Nuevitas by the river Maximo, and believed it to be a part of the mainland, until assured by the natives that it was an island; but in 1494, on his second trip, he reiterated his previous belief and called the land Juana, after Juan, the son of Ferdinand and Isabella. Subsequently he changed the name to Fernandina, in honor of Ferdinand; still later to Santiago, the name of the patron saint of Spain, and finally to Ave Maria, in recognition of the kind offices of the Virgin Mary, but the aboriginal name of Cuba clung to the island, and was never supplanted. A peaceable race of Indians, calling themselves Ciboneyes, were its inhabitants, living under nine independent *caciques*, and holding to a belief in a supreme being and the immortality of the soul. In 1502 Columbus visited Cuba a third time, and in 1511 his son, Diego Columbus, fitted out a colonizing expedition of 300 men, under Diego Velasquez, who made their first settlement at Baracoa, and in 1514 founded Santiago and Trinidad, also a place on the southern coast called San Cristobal de la Habana, a name soon transferred to another settlement, on the northern coast, and in 1519 to the present locality. The natives, reduced to slavery by these adventurers, and employed in the cultivation of sugar-cane and other crops, were so cruelly treated, that

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by 1553 their race was almost extinct, notwithstanding the appeals of Las Casas, the Roman Catholic apostle to the Indians, to the home government in their behalf. This humane missionary having observed in St. Domingo that the negroes seemed to possess a capacity for endurance superior to that of the Indians, in order to save the latter, went so far as to suggest that negroes should be imported to take their places in the mines and cane-fields. The colonists were not slow to act upon this suggestion, and thus negro slavery, by sanction of religious authority, gained a foothold in the western world. The Indians of Cuba, however, did not escape the extermination which Las Casas was so anxious to avert, while the negroes were subjected to cruelties that checked their natural increase and made it necessary to recruit their numbers by constant importations. In 1537 Diego Columbus relinquished his right to appoint a government for the island to the crown, and Hernando De Soto was appointed, under the title of captain-general. Havana was destroyed by the French in 1538, and again in 1554, and for a century and a half the people of the island were in almost continual fear of invasion of the French, Dutch, or English, or the pirates infesting the adjacent waters. Many laws were also made in Spain that were exceedingly disastrous to the prosperity of the island—e.g., a law prohibiting all foreigners, even Spaniards not native Castilians, from trading with or settling in the island. This led to smuggling, which was carried on largely, especially after the English captured Jamaica in 1655. Whatever importance and prosperity Cuba has attained seems to date from the treaty of Paris, 1763. Las Casas, appointed captain-general in 1790, was especially indefatigable in his efforts for the public good, removing many restrictions from commerce and promoting many useful public works. During the present century the island has been ruled by a succession of captains-general possessing almost absolute power, some of whom deserve praise for efforts to discharge their duties faithfully, while others can only be classed as oppressors, and whatever progress was made during their administrations was in spite of all obstacles mismanagement could invent—e.g., the royal order of the *Omnimodas*, ratified in 1836, which empowered captains-general to rule at all times as if the island were in a state of siege. Great sympathy has been felt for the Cubans by the United States, and several efforts have been made to purchase the island. In 1848 President Polk authorized the American minister at Madrid to offer $1,000,000, and in 1858 a proposal was made in the Senate to authorize an offer of $30,000,000, but this was finally withdrawn. In 1854 what is known as the "Ostend Manifesto," signed by Buchanan, Mason, and Soulé, United States ministers to Great Britain, France, and Spain, respectively, claimed the right of this country to annex Cuba if Spain refused to sell. In June, 1870, Spain enacted a law emancipating all slaves born after that date, also all those who were sixty years old or over, and in 1886 a general decree of emancipation was passed. Not a few attempts were made to secure the independence of the island and the abolition of slavery, but the insurrections, the most noted of which were those in 1849–51, under Lopez (q.v.), and in 1854 failed to accomplish anything, and were suppressed by the most cruel measures. The rebellion of 1868–78, however, induced the Spanish Government to promise the representation of Cuba in the Cortes by her own deputies, and a liberal party was formed to secure the fulfilment of this pledge, to encourage white immigration and to promote free trade. The general discontent remained, however, and in 1895 led to a second and very formidable revolt, to suppress which Spain sent Gen. Martinez Campos and over 120,000 troops. The insurgents under Gens. Gomez and Maceo succeeded in evading all attempts to exterminate them; and became so bold as in February, 1896, to approach so near to Havana that the sound of their firing was heard within the capital. In the same month Gen. Campos was recalled by the home government, and Gen. Weyler, a soldier reputed to be savage in his measures, succeeded him. In April, 1896, owing to the apparent success of the insurrection, the United States Congress passed a resolution recommending the President to recognize the belligerency of the Cuban patriots. See SPAIN, and UNITED STATES.

Topography, Geology, and Mineral Products.—The surface attains its greatest height on the southeastern coast, where the Sierra de Maestra or Cobre extends from Cape de Cruz to Punta de Maysi, and rises in some places to an altitude of 8000 feet. Another mountain ridge runs through the central part of the island, and rises in the extreme west, in the peak Pan de Guajaibon, to 2530 feet. A rugged hilly district lies northwest of Trinidad on the southwestern coast, and the Pico de Potrerillo, directly behind that city, is 2990 feet in altitude. The remaining portion of the country is, for the most part, undulating, and consists of well-watered plains covered with luxuriant forests or plantations, but there are some extensive tracts of marsh-land, particularly on the southern coast. The shores are generally low and are lined with dangerous reefs and shallows, but in many localities there are deep harbors or inlets, as at Havana, the admirable situation of which makes it the emporium of Central America. Five islands lie off the northern coast, the largest, Romano, having an area of 172 sq.m.; and of those on the southern side, Isla de Pinos (q.v.) has an area of 800 sq.m. Although the rivers number about 250, they are short, only one, the Cauto, having a course of seventy miles. This rises in the Sierra de Cobre, and empties into the bay of Buena Esperanza on the southern coast, and for sixty miles is navigable by schooners, though obstructed by bars at low tide. The other important rivers are the Sagua la Grande, navigable twenty miles, and the Ay or Negro. The Ay has a remarkable natural bridge and some falls nearly 200 feet high. The rivers flow either north or south, and their water is very pure. Sulphurous, sulphuro-gaseous, and thermal springs are numerous. The western part of the island is granitic, with primitive schist and gneiss·

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the central and southeastern portions calcareous on a schistose formation. Gold is found in several of the western rivers, copper in the metamorphic rocks generally, silver in several localities, excellent coal near Santa Clara on the southwestern coast, besides iron ore, quicksilver, red lead, antimony, and other minerals.

Climate.—The average temperature at Havana is 77°, where the maximum in August is 88° and the minimum in December, 58°. At Santiago de Cuba the yearly average is 80°, that of the hottest month being 84° and that of the coldest 73°. In the interior the mercury sometimes falls to the freezing point, and in the eastern part of the island hailstorms occur between February and July, ice occasionally forms, but snowfalls are almost unknown. The year is divided into a hot and wet season and a cool and dry season, attended with light showers, the former lasting from May to October, and the greatest rainfall occurring toward the end of the period. The average annual rainfall at Havana is about 40 inches, and for the island the average number of rainy days during the year is 102. From November to February cool north winds or "northers" visit the western part of Cuba, but rarely last more than forty-eight hours. The prevailing wind, however, is the easterly trade breeze. Violent thunderstorms occur from June to September, and hurricanes sometimes cause great destruction, as in 1870 and 1873. The eastern side of Cuba is subject to slight shocks of earthquake.

Flora and Fauna.—The vast forests abound in hard woods suitable for manufactures, shipbuilding, and cabinet work, such as the mahogany, cedar, Cuban ebony, ironwood, rosewood, and acana, dyewoods, palms of many varieties, including the cocoanut palm, the wild lime, and orange, with lianos, orchids, and ferns. There are few wild beasts of any size, the largest being deer, supposed to have been introduced, and wild dogs, the latter sprung from domesticated stock. The only peculiar quadruped is the jutia, or tailless rat, an animal about the size of a musk-rat, and with the habits of a raccoon. There are upwards of 200 indigenous species of birds, many of them of beautiful plumage. The vulture and turkey-buzzard, the principal birds of prey, are useful as scavengers, and are protected by law. There are more than 640 species of fishes. Turtles, land-crabs, oysters, and other shellfish abound. The alligator, cayman, and iguana are common, and there are a few kinds of snake, the *juba*, about six feet long, being venomous. The insects include 300 varieties of butterfly, nearly as many kinds of flies, twelve species of mosquitoes, an indigenous bee, the large night shining elater or firefly, the scorpion, tarantula, sandfly, chigoe (q.v.) or *nigua*, a destructive ant called the *bibijagua*, the still more destructive borer, *anobium bibliothecarium*, and some spiders whose bite is poisonous.

Agriculture and other Industries.—The soil is very fertile, immense crops of maize, rice, cotton, cocoa, sugar, coffee, tobacco, and all tropical fruits being raised. Both soil and climate seem peculiarly adapted to the cultivation of sugar, hence it has long been the chief product, and since the Civil War in the United States, which for the time entirely destroyed the sugar industry in the Southern States, the production in Cuba has steadily increased. Sugar and tobacco are the chief products, but the cultivation of sugar received a serious check from the war 1895–7. Coffee is also largely raised, though it does not now figure to any extent among the exports. The first coffee plantation was established in 1748, the seed having been brought from St. Domingo, and in 1891 there were about 700 plantations on the island. Tobacco is indigenous to Cuba, and its excellent quality is remarked the world over, that grown near Havana being considered the finest. About ten per cent. of the area of the island is under cultivation. The mulberry is raised for silk worms. The breeding of cattle and hogs and bee-keeping are important industries.

Commerce.—The chief exports are sugar, molasses, tobacco, cigars, and honey; the chief imports, rice, lard, flour, cotton and linen manufactures, iron, wrought and unwrought, lumber and furniture, coal, machinery and hardware, paper and stationery, oils, codfish, and jerked beef. About nine-tenths of the sugar and nearly all the molasses is exported to the United States. In 1894–95 the total yield of sugar was 1,004,264 tons, of which 832,431 tons were exported in 1895. Of this 769,962 tons were exported to the United States in that year. By far the greater part of the tobacco, and nearly half of the cigars, were exported to the United States. There is a considerable export of mahogany and other timbers, and honey, wax, and fruits are also articles of trade. There are valuable mines of iron, manganese, and copper. About 1000 miles of railway line connect Havana with other points, and there are private lines joining the larger sugar plantations with the main lines. Havana, the principal port of the island, was visited by 1179 vessels with a tonnage of 1,681,325 in the year 1895. The first submarine cable (to Florida) was laid in 1868. There are now several connecting with Jamaica and other West India islands. The first steamboat used in Cuba was purchased by a planter shortly after Fulton's trial trip on the Hudson river. Steamers now ply regularly between Havana and all the prominent ports of the other West India islands, the United States, and Europe.

Education and Literature.—The educational system of Cuba was at first conformed to that of Spain, but it has been changed for local reasons. Innocent XIII., with the approbation of Spain, established the Royal and Pontifical University of Havana in 1772. The Franciscans had previously instructed classes in philosophy and theology in their convent. In 1842 the university, which had been administered by the Dominican friars, became a national establishment, and the study of the natural sciences was introduced; but in 1863, under the ministry of Gen. Concha, the system of instruction

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was assimilated to that of Spain, and philosophical studies reduced to very narrow limits. There are two colleges for the clergy—one at Havana, the other at Santiago de Cuba. The expenses of education in the higher branches are defrayed from the general revenue, those of primary education by the town councils. In 1889 there were 720 public and 537 private schools, with an average attendance of 40,352 children. Many of the wealthy families send their children to the United States to be educated.

Literature began to develop in the eighteenth century, and was greatly aided by the establishment of printing in 1724. Among the prominent writers in the eighteenth century were the historians Arrati and Urrutia; the sacred writers and moralists, T. Barea, Francisco del Cristo, José Caballero, and Padre Gonzales; the jurisconsults, Francisco Conde, Pedro Ayala, and Rafael Gonzales; the writers of general literature, Francisco de Arango and Tomas Romay; the poets, Rubalcaba and Manuel Zequicha; and the dramatist and satirist, Padre José Rodriguez (a) Capacho. In the nineteenth century the list lengthens, and includes the historians A. Valdez and José Arango y Castillo, the sacred writers and moralists, Felix Varela and Padre Oliva; the jurisconsults, Francisco de Armas, Anacleto Bermudez, and Isidro Carbonell; the essayists and general writers, Tomas Romay, again, Frederico de Armas, Manuel Costales, and Gaspar Betancourt ("El Lugareño"); the poets, José Maria Heredia (1803–40), also senator and judge, and author of an exalted "Exile's Hymn;" Milanés, of Matanzas, Gabriel de la Concepcion Valdes ("Placido"), author of a stirring "Hymn to Liberty;" Rafael Maria de Mendive, who wrote *Pasionarias*, Juan Guëll y Rente, Joaquin Granados, and O'Hallorans, writer of love-songs and descriptive verses. All the imaginative literature of the nineteenth century is pervaded with passionate love of country and yearning for its independence. In art Vermay and Perouani have won distinction, and in music Gasper Villate, composer of the operas "Celia," "Balthazar," and "Cristobal Colon;" the mulatto violinist, Joseito White, and the Brindisis, father and son, Ignacio Cervantes, pianist and composer, also the gifted creole Jiminez family of Havana and Cienfuegos. Cuban music is said to have a decided character of its own, although based on and suggesting that of the mother country. Much of the instrumental and vocal music is in a minor key. There are many newspapers, but all are hampered by governmental restrictions.

Government, etc.—Cuba is divided into six provinces. At the head of the government is the governor-general aided by a council of administration. Both he and the members of the council are appointed by royal decree in Spain. Cuba is represented in the Spanish cortes by 30 deputies and 16 senators. The provinces are divided into judicial districts, each presided over by an "alcalde mayor" or judge, having under him local judges, and into political districts, each having its *ayuntamiento* or town council. The governor-general, or captain-general, has both military and civil power. Care has been taken to place the administration in the hands of the Spaniards who come directly from Spain. The alleged abuses of this system, having caused the insurrection of 1895–97, a revolutionary government was formed at Camaguey in September 1895, under the name of the Republic of Cuba. It consisted of a president, vice-president, and cabinet, the first revolutionary president being Salvador Cisneros Betancourt. The established religion is the Roman Catholic, and the ecclesiastical government is under an archbishop. The army, on a peace footing, numbered about 19,000 men, but the revolution brought in a large number of Spanish troops, which in May 1896 had increased to 135,000 regulars, with 40,000 volunteers. The estimated revenue for 1893–4 was 24,440,759 pesos; the expenditure 25,984,239 pesos. The debt, which in 1889 was $186,000,000, greatly increased to meet the necessities of the war. In 1896 it was placed at over $300,000,000, and in October 1897 a new loan was announced of £40,000,000.

Population.—Down to 1886 slavery existed, but in that year a law was passed to abolish it. About one-third of the inhabitants are creoles and natives, but the natives of Spain or "peninsulares" monopolize the government, control most of the trade, and despise the creoles. A third class of the population is composed of mulattoes and negroes who were free before the edict of emancipation. Below them is the class of liberated slaves. In 1894 the population of the island was placed at 1,631,696, of whom about 65% were whites. The capital, Havana, in 1888, had a population of 198,271, but it was estimated in 1896 at 250,000. Other important towns are Santiago de Cuba, pop. (1887), 71,307; Puerto Principe, 46,641; Holguin, 34,767; Sancti Spiritu, 32,608; Cienfuegos (1892), 27,430; Matanzas (1892), 27,900; and Cardenas (1892), 23,680.

See Hazard, *Cuba with Pen and Pencil* (Lond., 1873); Eden, *The West Indies* (Lond., 1880); Ballou, *Cuba, Past and Present* (Boston, 1885); U. S. *Consular Reports;* Davis, *Cuba in War Time* (1897).

CUBE, a solid with six square faces, each of which is parallel to the one opposite to it. It is a form of frequent occurrence in nature, especially among crystals. See CRYSTALLOGRAPHY. In arithmetic, the C. of a number is the product of its multiplication three times by itself. This use of the term arises from the circumstance that the solid contents of a C. may be expressed by the third power of the number which expresses the length of one of its edges. Thus, if the edge of a C. be a line of 4 in., its solid contents are equal to 64 cubic inches. Conversely, the C. root of a number is that number which, multiplied three times by itself, produces the first number. See DOUBLING THE CUBE.

CU'BEBS, or CUBEB PEPPER, the dried berries of *cubeba officinalis* and other species of *cubeba,* a genus of climbing shrubs of the natural order *piperaceæ,* very closely allied to the true peppers, but distinguished at once by the contraction and elongation of the berries at the base, so that they appear to be stalked, upon which account C. are sometimes called

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piper caudatum, or tailed pepper. *Cubeba officinalis* is a native of Penang, Java, New Guinea, etc., and is said to be extensively cultivated in some parts of Java. Its spikes are solitary, opposite to the leaves, and usually produce about fifty berries, which are globular, and when dried, have much resemblance to black pepper, except in their lighter color, and the stalk with which they are furnished. *Cubeba canina*, a native of the Sunda and Molucca islands, is supposed also to yield part of the C. of commerce, and the berries of *C. Wallichii* possess similar properties. C. are less pungent, and more pleasantly aromatic than black pepper; they are used in the east as a condiment, but in Europe chiefly for medicinal purposes; they act as a stimulant, and are sometimes found useful in cases of indigestion, also in chronic catarrhs, and in many affections of the mucous membrane, particularly those of the urino-genital system.

CUBIC EQUATIONS. A cubic equation containing but one unknown quantity, is one in which the highest exponent of the quantity in any term is 3. Every such equation can be reduced to the general form $x^3+px+q=o$, in which the co-efficient of x^3 is 1, and that of x^2 is zero. Every cubic equation of this form has three roots, all of which may be real, or one only may be real, and the other two imaginary. The roots will all be real, when p is essentially negative, and $\frac{p^3}{27} > \frac{q^2}{4}$ numerically. One root only will be real when p is essentially positive, or when it is negative, and $\frac{p^3}{27} < \frac{q^2}{4}$ numerically. If p is essentially negative, and $\frac{p^3}{27}=\frac{q^2}{4}$, two of the roots are equal. When one of the roots only is real, the equation may be solved by the following formula, known as Car dan's formula:

$$x=\sqrt[3]{-\frac{q}{2}+\sqrt{\left(\frac{q^2}{4}+\frac{p^3}{27}\right)}}+\sqrt[3]{-\frac{q}{2}-\sqrt{\left(\frac{q^2}{4}+\frac{p^3}{27}\right)}}.$$

When the roots are all real, this formula fails to give their values. Methods of solving C. E. are to be found in most books on trigonometry and algebra. They are all troublesome. The reader will find the theory of their solution admirably discussed in Young's *Theory of Equations*. See also EQUATIONS.

CU'BIT (Lat. *cubitus*), a measure employed by the ancients, equal to the length of the arm from the elbow to the tip of the middle finger. The C. of the Romans was about 17½ in., and that of the Hebrews, 22 in., but its length is now generally stated at 18 English inches.

CUCKING-STOOL. See DUCKING-STOOL.

CUCKOO, *Cuculus*, a genus of birds of the order of climbers (q.v.); the type of a family, *cuculidæ*, which contains a large number of species, mostly confined to the warmer regions of the globe, although some of them are summer visitants of cold climates. The beak is compressed and slightly arched, and the tail long and rounded, the wings rather long, the tarsi short, two toes directed forwards, and two backwards, the outer hind-toe capable of being brought half round to the front. The feet are thus adapted for grasping and moving about upon branches, rather than for climbing, and the long tail is much used by many of the species for balancing the body, as they hop from branch to branch in the thick tropical woods which they frequent. See illustration, BIRDS, vol. II., fig. 11, DEER, ETC., vol. IV., fig. 2. The name C. is derived from the note of the male of the common C. (*cuculus canorus*), which, although monotonous, is always heard with pleasure, being associated with all that is delightful in returning spring. A similar name is given to the bird in many languages. The C. is a very widely diffused bird; it is found in India and in Africa, and migrates northwards in summer, even to Lapland and Kamtchatka. It appears in Britain in April, and all except the young birds are believed to migrate southwards again before the middle of August. It frequents both cultivated districts and moors. There is no pairing or continued attachment of the male and female, and the female, after having laid an egg on the ground, deposits it, *with her beak*, in the nest of some other smaller bird, leaving the egg to be hatched and the young one to be fed by the proper owners of the nest. The egg of the C. is very small for so large a bird, being not larger than the skylark's, and the number she will lay is uncertain; but the young one soon acquires size and strength enough to eject from the nest any eggs which may remain in it, or unfortunate young birds, the true offspring of its foster-parents, and it seems restless and uneasy till this is accomplished. It works itself under them, and then jerks them out by a motion of its rump. Its back at this early age exhibits a peculiar depression between the shoulders, so that an egg or a young bird can easily be got to lie upon it; but this depression soon disappears, and along with it the singular instinct with which it is supposed to be connected. The hedge-sparrow, the yellow-hammer, the pied wagtail, and the meadow pipit, are among the birds most frequently selected by the C. as its substitutes in incubation and the care of its young. A pair of meadow pipits usually accompany the C. wherever it goes. The reason of this curious fellowship has not been ascertained.—Among the *cuculidæ* of North America, one of the most interesting is the yellow-billed American C., sometimes called from its note the *cow-cow* or *cow-bird* (*coccyzus Americanus*). It is among the rarest of British birds. It does not lay its eggs in the nests of other birds, but builds and hatches for itself—exhibiting, however, a remark-

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able peculiarity in laying its eggs at such long intervals, that a very evident difference of age appears among the young in the same nest.

CUCKOO, a mag. dist., Louisa co., Va., including Cuckoo, or Cuckooville. Population, '90, 4294.

CU'CUMBER, *Cucumis*, a genus of plants of the natural order *cucurbitaceæ*. The common C. (*C. sativus*), distinguished by heart-shaped, acuminately pentangular leaves, which are rough with hairs approaching to bristles, and oblong fruit, is a native of the middle and s. of Asia, and has been cultivated from the earliest times. Its fruit forms an important article of food in its native regions, the s. of Europe, etc., and an esteemed delicacy in colder countries, where it is produced by the aid of artificial heat. Many varieties are in cultivation, with fruit from 4 in. to 2 ft. long, rough, smooth, etc. Young cucumbers are much used for pickling, and are called *gherkins*. The C. is cultivated in fields even in the s. of England, for the supply of the London market; but in the northern parts of Britain, the aid of a hot-bed is required even to produce fruit fit for pickling. The C. requires a sunny situation, and a free rich soil.—To this genus belong other species valued for their edible fruit. *C. anguria* is a West Indian species, with fruit about as large as a pullet's egg, much esteemed as an ingredient in soups. The SNAKE C. (*C. flexuosus*) grows to a great length, and is similar in quality to the common cucumber. *C. serotinus* is cultivated in Turkey, *C. macrocarpus* in Brazil; the CONOMON (*C. conomon*) is much cultivated in Japan. The melon (*C. melo*), water-melon (*C. citrullus*), chate (*C. chate*), and kaukoor (*C. utilissimus*), are noticed in the article MELON; the species yielding colocynth, in the article COLOCYNTH.—The DUDAIM (*C. dudaim*) is very generally cultivated in gardens in the east for the fragrance of its fruit, which, however, is almost tasteless. It is supposed that this plant is sometimes meant in the Old Testament, where the English version has *mandrake*.—The SPIRTING C., SQUIRTING C., or WILD C., which yields the drug called elaterium (q.v.), belongs to an allied genus.

CUCUMBER TREE, an American forest tree of the magnolia species, growing in nearly all the states. The fruit, which looks like a cucumber, when macerated in spirits makes a bitter tonic drink. The timber is light and useful for boat-building.

CUCURBITA'CEÆ, a natural order of exogenous plants, consisting chiefly of herbaceous plants, natives of the warmer regions of the globe, having succulent stems which climb by means of lateral tendrils. There are some shrubby species. The fruit (*pepo*) is peculiar; it is more or less succulent, has a thick fleshy rind, and the seed bearing parietal placentæ either surrounding a central cavity, or sending prolongations inwards. The seeds are flat and ovate, embedded in a sort of pulp, which is either dry or juicy.—This order contains about 300 species, very many which yield fruits much used for food in warm climates, and some of them are cultivated in colder regions as articles of luxury. The fruit of some attains a very large size. To this order belong the cucumber, melon, gourd (of many kinds), pumpkin, squash, vegetable marrow, bottle gourd, etc. The young shoots and leaves of many species are also used as pot-herbs; and the roots of some abound in a bland fecula, and are edible, as those of *momordica dioica* and *bryonia umbellata*, East Indian plants. Yet acridity is a prevailing characteristic, of which the spirting cucumber (see ELATERIUM) of the s. of Europe, and the common bryony (q.v.) are examples. These are not without their use in medicine, but still more important is the colocynth (q.v.).—Among the more interesting species of this order is *hodgsonia heteroclita*, a gigantic species, which is found in the Himalaya mountains, ascending to an elevation of 5,000 feet. The seeds of some C. are used as almonds, and yield oil by expression, as those of *telfairia pedata*, an African plant.

CUD (A.-S., *cud*, from *cēowan*, to chew) the mass of cropped herbage which ruminants drive from the first and second cavities of the stomach back into the mouth. There it is chewed leisurely and again passed down to the stomach, usually to the third cavity. The chewing of the cud seems to afford the animal great pleasure, and is generally done in quiet and repose.

CUD'BEAR, a dyestuff similar to archil (q.v.) and litmus (q.v.), and obtained in the same manner from lichens by the action of ammoniacal liquids. It is chiefly employed as a purple-dye for woolen yarn, but the color is rather fugitive. The name C., or C. LICHEN, is often appropriated to one particular species of lichen, *lecanora tartarea*, which is abundant on rocks in the highlands of Scotland and in the Alpine and northern districts of Europe, and from which the dyestuff C. is usually obtained by maceration for ten or twelve days in urine, with water and chalk. The name is a corruption of *Cuthbert*, and is derived from that of Dr. Cuthbert Gordon, under whose management the manufacture of this dyestuff was begun in Leith about the year 1777, by Mr. Macintosh of Glasgow. The species of the genus *lecanora* are crustaceous lichens, with a flat uniform *thallus*, and unstalked *shields*. *L. tartarea* forms a thick, granulated, and tartareous grayish-white crust, with scattered yellowish-brown shields. It is sometimes called *white Swedish moss*, being largely imported from Sweden.

CUDDALORE', the chief t. in the southern division of Arcot (q.v.), is one of the few seaports on the Coromandel, or e. coast of Hindustan. It is situated on the estuary of the southern Pennaur, a considerable tributary of the bay of Bengal, being in lat. 11° 43' n., and long. 79° 50' east. It is 15 m. to the s. of Pondicherry, and 100 to the s.

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of Madras. Though the river itself is beset by a bar, which admits only vessels of moderate size, yet there is good anchorage off shore at the distance of a mile and a half. The site is not more than 5 ft. above high-water mark; but notwithstanding this apparently insalubrious position, the climate is said to be healthy. Pop. '91, 47,400.

CUD'DAPAH, the district mentioned in the following article, extends in lat. from 13° 12′ to 16° 19′ n., and in long. from 77° 52′ to 79° 48′ e., containing 8722 sq.m., and '91, 1,272,000. inhabitants. Sloping towards the bay of Bengal, the country ranges, in its general elevation above the sea, between 1182 and 450 feet. C. is traversed in its length from n. to s. by numerous parallel ridges, which constitute a part of the eastern Ghauts—some of the peaks rising 3,500 ft. above the sea level. The maximum, mean, and minimum temperatures are said to be respectively 98°, 81°, and 65° F. In the hot season, the climate is understood to be peculiarly prejudicial to European constitutions. The most striking feature in the physical character of the district is the remains of diamond mines, now abandoned, and probably exhausted, situated about 7 m. from the capital. C. was ceded to Britain in 1800; and in 1846 it was the scene of serious disturbances, occasioned by an unwise interference on the part of government with the prescriptive titles to landed property.

CUDDAPAH, .. ative t. with a military cantonment in the presidency of Madras, from which it lies about 140 m. to the n.w. It stands, at the height of 507 ft. above the sea, near the right or s. bank of the northern Pennaur, which flows into the bay of Bengal. Lat. 14° 32′ n., and long. 78° 52′ east. The native town itself claims notice merely as the capital of the district of its own name; and the military cantonment, pleasantly overhanging the Bogawanka, an auxiliary of the Pennaur, contains barracks for Europeans, and spacious lines for sepoys. Pop. '91, 17,400.

CUDDY was a name first applied in East India trading ships to a cabin under the poop, where the men messed and slept. The same name afterwards given to the only cabin in very small vessels, and sometimes to the cooking-room.

CUDWEED, the popular name of many species of plants of the genera *gnaphalium*, *filago*, and *antennaria*, belonging to the natural order *compositæ*, sub-order *corymbiferæ*, the stems and leaves of which are more or less covered with a whitish cottony down; and the heads of flowers consist, in great part, of dry involucral scales, and may be kept for a long time without undergoing much apparent change, so that they may be reckoned among *everlasting flowers* (q.v.). The cudweeds are small plants of very unpretending appearance, some of them common in Britain. *Antennaria dioica* is very frequent in dry mountain pastures. It is sometimes called cat's-foot. Its heads of flowers, from the appearance of which it derives this name, were formerly officinal, and were employed as an astringent in pectoral diseases.

CUD'WORTH, RALPH, D.D., an illustrious English divine, was b. in 1617 at Aller, in Somersetshire, and admitted pensioner of Emmanuel college, Cambridge, in 1630, where he took his degree of M.A., and became an eminent tutor. About 1641, he was presented to the rectory of North Cadbury, in Somersetshire; and in 1644, upon taking his degree of B.D., maintained two theses, in which can be discerned the germs of his *Intellectual System*. In the same year he was appointed master of Clare hall, Cambridge, and in 1645, regius professor of Hebrew; after which he began to apply himself assiduously to the study of Jewish antiquities. In 1651, he took his degree of D.D.; in 1654, he was chosen master of Christ's college; in 1662, appointed to the vicarage of Ashwell; and in 1678, installed prebendary of Gloucester. He died at Christ's college, July 26, 1688.

C.'s *magnum opus*, entitled *The True Intellectual System of the Universe*, was published in 1678. It is a work of great learning, acuteness, and loftiness of thought; but some, at the time, fancied that C. exhibited too much impartiality in stating the atheistic arguments. Dryden said "that he raised such strong objections against the being of a God and Providence, that many thought he had not answered them." Lord Shaftesbury and Bayle were of this opinion also. The accusation of impartiality—a rare offense in those contentious days—is not likely to lessen our admiration of Cudworth. The philosophy to which he was attached was that of Plato, and, in consequence, he estimated highly the writings of the Alexandrian school, to which his own bear some resemblance. The obloquy to which his adventurous studies exposed him, does not seem to have greatly affected him. Besides *The Intellectual System*, C. left in MS. *A Treatise concerning Eternal and Immutable Morality*, which was published by Dr. Chandler, bishop of Durham, in 1731.

CUE. On the stage the last words of an actor's speech, which are a signal for other actors to enter or speak. It is generally derived from the Latin *cauda* a tail, through the French *queue*. Wedgwood, however, follows Charles Butler, a grammarian of 1634, who asserts it to be the first letter of *quando*, "when."

CUEN'CA, a city of Spain, at the confluence of the Jucar and Huecar, about midway between Valencia and Madrid. It is romantically situated on a rocky eminence, 3,400 ft. above the level of the sea, and is surrounded by hills. It appears to have derived its name (Lat. *concha*, a shell) from its position and appearance. Ford says it is "indeed a hill-girt *shell*." The town is of Moorish origin. The streets are narrow and crooked. The chief buildings are the cathedral, the bishop's palace, and a fine bridge over the

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Jucar (erected in 1523), connecting the city with the convent of San Pablo. C. was once celebrated for arts, literature, and industry, but its glory has now quite departed. It suffered much during the Peninsular campaign. Pop. '87, 9,747.—C. gives name to a mountainous, well-watered province, yielding excellent timber, honey, wine, and grain, with good pasture, and various minerals, including iron, coal, copper, and silver. Area about 6725 sq. miles. Pop. '87, 242,024.

CUENCA, a city of Ecuador, in South America, stands on a wide plain or table-land, 8640 ft. above the level of the sea. It is 85 m. s.s.w. of Quito, the capital of the republic; in lat. 1¼° s., its proximity to the equator, however, being largely neutralized, with regard to climate by its altitude. Pop. estimated at 25,000 to 30,000. It possesses a cathedral and a university.

CUE'VA DE VE'RA, a t. of Spain, in the province of Granada, 42 m. n.e. of Almeria. It is situated on a plain on the right bank of the Almanzor, near its entrance into the Mediterranean. It is generally well built, and its streets regular. The principal edifices are an old Moorish castle, and the parish church in the Doric style. C. has manufactures of hardware, earthenware, and of wine and oil; and a large number of persons are employed in mines in the vicinity. Pop. 20,644.

CUFFEE, PAUL, 1759–1818; a negro sea-captain, b. near New Bedford, Mass., who accumulated a fortune in seafaring life. He was a member of the society of Friends. He was among the first to encourage the colonization of his people in Sierra Leone.

CUFFEE, PAUL, 1757–1812; an Indian of the Shinnecock tribe, on Long island, N. Y.; long employed as a preacher by the New York missionary society.

CUFIC WRITING. See KUFIC WRITING.

CUICHUNCHUL'LI, *Ionidium parviflorum*, a Peruvian plant of the natural order *violaceæ*, half-shrubby, with minute leaves, possessing very active emetic and purgative properties, and said to be a certain remedy for *elephantiasis tuberculata*, a reputation which, if even partially well founded, ought to recommend it to the particular attention of the benevolent and humane. Other species of *ionidium* share the same name, properties, and reputation. One of them was formerly supposed to yield ipecacuanha, and its root is still known as white ipecacuanha. See IPECACUANHA.

CUIRASS, as its name (Fr. *cuir*, leather) implies, was originally a jerkin, or garment of leather for soldiers, so thick and strong as to be pistol-proof, and even musket-proof. The name was afterwards applied to a portion of armor made of metal, consisting of a back-plate and breast-plate hooked or buckled together; with a piece jointed to the back called a *culet* or *garde de reines*.

CUIRASSIERS', in the time of queen Mary, were heavy horsemen wearing body-armor over buff-coats. They carried swords and pistols, and the reins were strengthened with iron chains. In modern armies, the name is often given to the heaviest cavalry. Napoleon's 12 regiments of C. attracted much attention during his wars. The first rank of Russian C. are armed with lances. The only C. in the British army (wearing the cuirass) are the life guards (red) and horse guards (blue); and in these the cuirass is now regarded rather as a matter of show than of use.

CUISSARTS, among ancient armor, were worn by troopers. They consisted of small strips of iron-plate laid horizontally over each other round the thigh (Fr. *cuisse*), and riveted together.

CUJA'CIUS, properly JACQUES DE CUJAS, or CUJEUS, one of the most distinguished jurists of the 16th c., b. in 1522, was the son of a tanner of Toulouse. After studying law, he was appointed teacher of the same at Cahors (1554), and in the following year, by the recommendation of the chancellor L'Hopital, gained the chair of law in the university of Bourges. In 1557, he become a professor at Valence. After several changes, he returned to Bourges in 1577, where he resided till his death, Oct. 4, 1590.

His great reputation as a jurist was founded on his study of original MSS. of the Roman laws, and on his classical treatment of these authorities. He had in his library 500 MSS. on Roman law, and by his emendations contributed greatly to remove the obscurities of jurisprudence. A complete collection of his works was edited by Fabrot (10 vols., Par. 1658), and has since been republished frequently. Uhl has edited separately C.'s *Animadversiones et Observationes*. C.'s daughter made herself notorious by her immoralities. See Spangenberg's *C. und seine Zeitgenossen* (Leip. 1822).

CUL'DEES, or KELDEES, (Celt. *Ceile-De;* Lat. *colidei, culdei, calledei, keldei, keledei*), the name given in the British islands to an ancient order of ecclesiastics. The word seems to be of Celtic origin, and in the Irish language signifies an "attendant of God." Giraldus Cambrensis, writing towards the end of the 12th c., when the order still flourished, interprets the name in one place by the Latin word *cœlicola*, i.e., "worshiper of heaven;" and in another by *cœlebs*, i.e., "single," or "unmarried." Boece and Buchanan, in the 16th c., translate it *cultores Dei*, i.e., "worshipers of God."

There is some uncertainty as to the first appearance of the order. There is no trace of it in the works of Adaman, of Bede, of Alcuin, or of any other ecclesiastical historian of the 8th or 9th century. An abbot and bishop of the n. of Ireland, who compiled a metrical calendar of Irish saints about the year 800, was known in his own time as

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"Ængus the Ceile-De." But it has been questioned whether the title was not used rather to denote his great personal piety, than to describe his ecclesiastical character. The four masters, again, in their *Annals of Ireland*, compiled about the year 1636, record certain great wonders wrought by a Ceile-De in the year 806. But no such event is recorded in the ancient chronicles from which the four masters compiled their work, and Irish antiquaries think that the passage must therefore be rejected as apocryphal. But in Irish annals of undoubted authority, it is chronicled that, in the year 919, "a Ceile-De came across the sea westward to establish laws in Ireland;" in other words, as Irish archæologists conjecture, to bring the Irish into conformity with the rule for canons which had been enacted in 816, at the council of Aix-la-Chapelle. The annals of Ulster record that, in 920, Armagh was plundered by Godfrey, son of Ivor, the Dane, but that he spared the oratories with the C. and the sick. The C. of Armagh, who thus appear in the beginning of the 10th c., survived till the beginning of the 17th century. Archbishop Usher, who died in 1655, writes that they continued until within his own memory. They were secular priests or canons, about 12 in number, living in community, under the rule of a prior, who—after the beginning of the 13th c., when the metropolitan cathedral of St. Patrick was remodeled after the English fashion—officiated as precenter, his C. being the clerks or choir. The antiphonary or service-book, with the musical notation, from which they sang, is still preserved in the library of Trinity college, Dublin; and its calendar records the deaths of several of their number, one of them so lately as the year 1574. The prior seems generally to have been a pluralist, it having been formally ruled in 1448, after an appeal to Rome, "that the priory of the college of secular priests, commonly called Culdees, being a simple office, and without cure of souls, is not incompatible with a benefice." The C. of Armagh, dissolved at the reformation in 1541, were resuscitated for a brief space in 1627. Their old possessions—among which were 7 town-lands containing 1423 acres, 7 rectories, and 4 vicarages—were, in 1634, bestowed upon the vicars choral of the cathedral, who still enjoy them.

There were at least 7 other houses of C. in Ireland, viz., at Clonmacnois, Clondalkin, Devenish, Clones, Popull, Monanincha, and Sligo.

If tradition could be trusted, the first appearance of C. in Scotland should be placed about the middle of the 9th century. A leaf of the register of St. Andrews, written about 1130, relates that Brude, the son of Dergard, the last king of the Picts (who ceased to reign about 843), gave the island, since called St. Serf's Inch, in Lochleven, to God, St. Servan and the Culdee hermits serving God there. They were governed by an abbot; and about the year 1093, during the rule of abbot Ronan, they gave up their island to the bishop of St. Andrews, on condition that he should find them in food and raiment. They had grants of lands or immunities from all the kings of the Scots who reigned between 1039 and 1153, the roll of these royal benefactors being headed by the renowned Macbeth (1039–56) and his wife Gruoch, the daughter of Bodhe. They had a grant of a church from each of the three bishops who ruled the see of St. Andrews between 1040 and 1093; and about 1120, they had a grant of lands from one of the sons of king Malcolm Canmore and St. Margaret—Ethelred, earl of Fife, and hereditary lay-abbot of the Culdee monastery of Dunkeld. A few years afterwards, the bishop of St. Andrews gives their island, and all their possessions, including their church vestments and their books, to the newly founded canons regular of St. Andrews, in order that a priory of that rule might supplant the old abbey of C. in St. Serf's Inch. About 1140, the bishop's grant was enforced by a charter from king David, in which it was ordered that such of the C. as chose to live canonically and peacefully under the new canons should remain in the island. "If any one of them refuse so to do," says the king, "my will is, and I command, that he be expelled from the island." We hear no more of the Culdee hermits of Lochleven. The canons regular who came in their place continued till the reformation, and we are indebted to one of their priors, Andrew Wyntoun, who died about 1429, for a valuable metrical chronicle of Scotland. A catalogue of the books of the Culdee abbey, when it was bestowed upon the canons regular of St. Andrews, about 1140, has been preserved. The number of volumes was not quite twenty. They were—a pastoral, a gradual, a missal, some of the works of Origen, the sentences of St. Bernard (who was still living), a treatise on the sacraments, in three parts, a part of the Bible, a lectionary, the Acts of the Apostles, the gospels, the works of Prosper, the books of Proverbs, Ecclesiastes, and Canticles, a gloss on the Canticles, a work called *Interpretationes Dictionum*, a collection of sentences, a commentary on Genesis, and a treatise on the exceptions from ecclesiastical rules.

The C. of St. Andrews were of more importance, and not perhaps of less antiquity, than those of Lochleven. The death of an abbot of St. Andrews is chronicled by the Irish annals in 747. It is not said that he was a Culdee; but in 944, when Constantine, the king of Scots, exchanged his crown for a monk's cowl, it is recorded that he became "abbot of the Culdees of St. Andrews." No more is heard of them till about the middle of the 12th century. A priory of canons regular had now been planted beside them, and from its records we learn that in the church of St. Andrew, such as it then was, there were thirteen C., holding their office by hereditary tenure, and "living rather according to their own pleasure and the traditions of men, than after the rules of the holy fathers;" that some few things of little importance they possessed in common; that

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the rest, including what was of most value, they held as their private property, each enjoying what he got from relatives and kinsmen, or from the benevolence granted on the tenure of pure friendship, or otherwise; that after they became C., they were forbidden to have their wives in their houses, or any other women of whom evil suspicion could arise; that the altar of St. Andrew was left without a minister, nor was mass celebrated there except on the rare occasion of a visit from the king or the bishop, for the C. said their own office after their own way in a corner of the church. The attempt to supplant the C. by canons regular, which had succeeded at Lochleven, was repeated at St. Andrews, but failed. The C. kept their own church—St. Mary's, or the Kirk of the Heugh—and had a voice along with the canons regular in the election of the bishop Their abbot disappears about the middle of the 11th c.; and soon afterwards their "prior" exchanges that title for the name of "provost." Their distinctive character was gradually passing away; before the end of the 14th c., they lose their share in the election of the bishop; their name of Culdee is heard no more; their church, about the same time, takes the name of the King's chapel-royal; and henceforth there remains nothing to distinguish them from the secular priests of other collegiate churches.

The C. of the church of St. Mary at Monymusk, in Aberdeenshire, appear to have been founded by the bishop of St. Andrews towards the end of the 11th century. In the beginning of the 13th c. they are found making claim to be regarded as canons regular. The claim was resisted by the bishop of St. Andrews, and in 1211, after an appeal to Rome, the dispute was settled by a compromise, which provided that there should be thirteen C. at Monymusk, of whom one—to be chosen by the bishop from a list of three presented by the other C.—should be the master or prior; that they should have a refectory, a common dormitory, and an oratory, but no cemetery; that they should not adopt the monastic or canonical life or rule without leave of the bishop; and that when he came to Monymusk, he should be received by the C. in solemn procession. Before this agreement is 50 years old, the name of C. disappears from Monymusk, and their house is recognized as a priory of canons regular.

C. are found at Abernethy, in Strathearn, about 1120. In the end of that century, their possessions appear to have been divided between their hereditary lay-abbot (the founder of the noble family of Abernethy) and the prior and C. by whom the burden of the ecclesiastical offices was borne. In 1273, they were transformed into canons regular. The same partition of the Culdee revenues which appears at Abernethy, is found also at Brechin. A layman, who is abbot only in name, inherits a large share of the Culdee patrimony, and transmits it to his descendants, who soon lose even the name of abbot. The prior and his C., meanwhile, are absorbed into the chapter of the new bishopric, founded at Brechin by king David I., about 1145; in less than a hundred years, the name of C. disappears, and the chapter is one wholly of secular canons. The same silent change of C. into secular canons, which took place at Brechin during the 13th c., took place also at Dunblane, at Dunkeld, at Lismore, at Rossmarky, and at Dornoch C. are found in the bishop's chapter at each of these places in the 12th c.; they disappear before the end of the 13th c., leaving the chapter one of secular canons. At Dunkeld, as at Brechin and at Abernethy, great part of the Culdee revenues was held by a lay-abbot, whose office was of such mark as to be hereditary in the royal family. The father of "the gracious Duncan," and the son of St. Margaret, were Culdee abbots. If a tradition of the 16th c. can be received as authority for what passed in the 12th c., the C. of Dunkeld were married, like the priests of the Greek church, but lived apart from their wives during their period of service at the altar.

C. are found holding land at Monifeith, near Dundee, about 1200; and there was a lay-abbot of Monifieth; but there is nothing to show whether he was or was not a Culdee. The C. of Muthill, in Strathearn, appear with their prior in charters of the beginning of the 13th century. Nothing more is known of them. Jocelin of Furnes, in his Life of St. Kentigern, or Mungo, written about the year 1180, relates that the disciples of that saint at Glasgow, in the 6th c., had all things in common, but lived each in his own hut, whence they were called "solitary clerks," and more commonly "Culdees." C. appear as one of the ecclesiastical fraternities of Iona in the year 1164; and the faint vestiges of a circular building (about 15 ft. in diameter) called "Cothan Cuildich," or the Culdee's cell, are still shown in the island.

Only one or two traces of C. have been observed in England. The canons of St. Peter's, at York, were called C. in the reign of Æthelstan (924–31); and a charter of Æthelred, in the year 1005, speaks of the canons of the English cathedrals generally as *cultores clerici*. The term is of doubtful import, and the charter itself is not beyond suspicion.

Of the C. in Wales, we have only one notice. Giraldus Cambrensis, writing about 1190, describes the island of Bardsey, on the coast of Caernarvon, as inhabited by "most devout monks, called celibates or Culdees."

Such is a concise recapitulation of all that is certainly known of the Culdees. Before their history was ascertained, opinions were held regarding them which now find few if any supporters among archæologists. It was believed that they were our first teachers of Christianity; that they came from the east before corruption had yet overspread the church; that they took the Scripture for their sole rule of faith; that they lived under a form of church-government approaching to presbyterian parity; that they rejected prel-

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acy, transubstantiation, the invocation of saints, the veneration of relics, image-worship, and the celibacy of the clergy; and that they kept their simple worship and pure doctrines undefiled to the last, and were suppressed only by force and fraud, when the Roman Catholic church triumphed over their older and better creed. For all this, it is now clearly seen that there is no foundation. There is no reason to suppose that the C. differed in any material point of faith, discipline, or ritual from the other clergy of the British islands and western Christendom. Their name was their only peculiarity.

The best account of the Irish C. is given in a dissertation by the Rev. Dr. Reeves, in the *Proceedings of the Royal Irish Academy* for 1860. The best account of the Scottish C. is given in Mr. Grub's *Ecclesiastical History of Scotland*, vol. i. pp. 226–43 (Aberd. 1861). The opinions formerly held regarding the Scottish C. will be found in Selden's preface to the *Decem Historiæ Anglicanæ Scriptores*, reprinted in his *Opera*, vol. ii. pp. 1129–46; sir J. Dalrymple's *Collections concerning the Scottish History* (Edin. 1705); and the late Rev. Dr. Jamieson's *Historical Account of the Ancient Culdees* (Edin. 1811). The opinions of these writers are controverted in bishop Lloyd's *Historical Account of Church Government*, chap. vii.; Goodall's *Preliminary Dissertation* and bishop Russell's *Supplement*, prefixed to Keith's *Catalogue of Scottish Bishops* (Edin. 1824); Pinkerton's *Inquiry into the Early History of Scotland*, vol. ii. pp. 270–73 (edit. 1814); and Chalmers's *Caledonia*, vol. i. pp. 434–39 (Lond. 1807). On the subject of the C. generally, reference may be made to Lanigan's *Ecclesiastical History of Ireland*, vol. iv.; to the dissertation by J. van Hecke in the *Acta Sanctorum Octobris*, vol. viii.; and to Skene's *Celtic Scotland*, vol. ii.

CUL-DE-SAC, a street or alley with an opening at only one end, easy therefore of entrance, but not for exit; thence any close, confined, uncomfortable place.

CUL'ENBORG, CUL'EMBORG, or KUIL'ENBURG, a t. of the Netherlands, in the province of Gelderland, situated on the left bank of the river Leck, 12 m. n.w. of Tiel. C. has three divisions, of which the inner town is the oldest and most important. It has churches, charitable institutions and manufactures of ribbons, chairs, arms, etc. It has steamboat and railway communications. In olden times, the "Dominion of Culenborg" formed a county; and its independence, both of the Roman empire and the states of Holland, secured it the singular privilege of offering an asylum to fugitives from Holland for debt. Pop. '89, 7653.

CULIACAN', a t. of the Mexican confederation, stands on a river of its own name, which, flowing towards the s.w., enters the gulf of California near its mouth. It occupies a fertile tract in the department of Sinaloa, being about 90 m. to the s.e. of the city so called. Pop. '89, 8000.

CULILAWAN BARK, also called CLOVE BARK, a valuable aromatic bark, the product of the *cinnamomum culilawan*, a tree of the same genus with the cinnamon (q. v.) tree, growing in the Molucca islands. It comes to market in pieces of various length, almost flat, thick, fibrous, covered with a white epidermis, reddish-yellow inside, and has an odor resembling that of nutmeg and cloves, and a pungent taste. It is useful in cases of indigestion, diarrhea, etc.—Another variety of C. B. is believed to be the produce of *cinnamomum xanthoneurum*; and a very similar bark, called SINTOC BARK, is obtained from *C. sintoc*.

CUL'LEN, a royal, parliamentary, and municipal burgh and seaport in the n. of Banffshire, 12 m. w.n.w. of Banff. It is built on the w. slope of an eminence overlooking the sea, and at the mouth of the Cullen Burn. Pop. '91, about 2500. Many of the inhabitants of the town are engaged in the cod, ling, haddock, skate, herring, and salmon fisheries. C. contributes with Elgin, Banff, Peterhead, Inverury, and Kintore in returning one member to parliament. The chief exports are cured fish, oats, potatoes, Some linen is made. The marquis of Montrose burned C. in 1645.

CULLEN, PAUL, D. D., cardinal, b. in Ireland, 1803; educated in Rome; made cardinal, 1866. He was the first man of Irish birth who had been made a cardinal since the reformation. He d. 1878.

CULLEN, WILLIAM, a well-known physician of the last century, and one of the most celebrated professors of medicine in the universities of Edinburgh and Glasgow, was born at Hamilton, in Lanarkshire, on the 15th day of April, 1710. His father was factor to the duke of Hamilton, and was possessed of a little landed property in the parish of Bothwell; he appears to have brought up two of his sons to the learned professions, and to have himself received a legal education. William C. received the first part of his education at the grammar-school of Hamilton, and afterwards began his medical studies in Glasgow by an apprenticeship, and by attending literary classes in the university. At this time (about 1727), it does not appear that there was any systematic medical teaching in Glasgow university, though the medical school of Edinburgh was just rising to the height of its fame, under the auspices of the first Monro. C.'s master in the art, however, Mr. John Paisley, was a liberal and enlightened man, having a valuable library, of which the pupil may be presumed to have made good use. In 1729, having completed for the time his medical education, he was appointed surgeon to a merchant-ship, trading to the West Indies; and from this time till 1734, he was actively engaged in learning his profession practically in various situations, but without accept-

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ing any permanent responsibility. He next spent two additional winter-sessions in Edinburgh in the regular study of medicine, and was one of the founders of that important students' association—since called the royal medical society—the object of which was, and is, the advancement of the medical knowledge of the members by periodical discussions on subjects of interest connected with medical study. In 1736, he commenced practice at Hamilton, and very soon was largely employed, having secured from the first the influence and friendship of the duke of Hamilton and of other persons of distinction. Soon after, he became acquainted with William Hunter, afterwards the celebrated anatomist and obstetric professor, and brother of the still more celebrated John Hunter. See HUNTER, JOHN and WILLIAM. The three years passed by Hunter under Cullen's roof formed the beginning of a life-long friendship, although after Hunter went to London, it is probable that they never again met. In 1740, C. took the degree of doctor of medicine in the university of Glasgow; in 1741, he entered into partnership with a surgeon, with the view of confining himself to a physician's practice; in 1744, he responded to the invitation of a number of families in Glasgow, and took a house in that city, an object which it is probable he had in view some years before, but which he was prevented from carrying out by the friendship and liberal patronage of the duke of Hamilton, who died in 1743. Various circumstances indicate that during the seven years passed in practice in Hamilton, C. was diligently preparing, not only for the practice, but also for the teaching, of his profession; and accordingly, he had no sooner settled in Glasgow, than we find him engaged in giving a course of lectures, in regard to which his correspondence with William Hunter sufficiently shows that it was successful, and deserved success. Up to this period, though professorships of medicine, and of anatomy with botany, existed in the university, no lectures were delivered in either medicine or botany; and it seems certain that to C. that university owes the real commencement of its medical school; for in one or two years succeeding 1746, he made arrangements with the several professors to lecture on the theory and practice of physic, on botany and the materia medica, and finally on chemistry, being assisted in these last departments by Mr. John Carrick, who also acted as assistant to the professor of anatomy. In botany, C. seems to have lectured in Latin, but in the other departments he adopted the English language as the vehicle of expression, an innovation of great importance, which permitted him to adopt a more familiar style of lecturing than had hitherto been in use. One of his original hearers records that "in the physic class, Dr. Cullen never read lectures, but only used notes; in the chemistry, he sometimes read, but very seldom." *

He was supported by the university by votes amounting to £136 for the chemical laboratory, and £20 annually for keeping it in repair. As a chemist, he does not appear to have made any notable discovery; but he imbued the minds of his pupils with large and liberal views of a science then very imperfectly studied, and was beyond all doubt the means of raising up the great reputation of Dr. Black, by turning his thoughts to the subject of latent heat, which he prosecuted so successfully by a series of conclusive and most original experiments. In 1751, after somewhat prolonged negotiations, C. was placed, through the influence of the duke of Argyle, for the first time in his rightful position as a professor in the university of Glasgow, in room of Dr. Johnstone, the professor of medicine. But by this time it had begun to be apparent that an opening both for teaching and practice existed in Edinburgh, and lord Kames, whose knowledge both of general science and of Edinburgh society placed him in a favorable position for judging of the chances of success, made several attempts to attract the rising and ambitious Glasgow professor to the metropolis; in which design, however, he was not successful till four years afterwards, when C. was elected by the town-council joint professor of chemistry with Dr. Plummer, who had fallen into bad health, and who died about a year afterwards. In 1757, his ever-active mind found a new direction in adding to his duties as professor of chemistry the teaching of clinical medicine in the royal infirmary, a duty up to this period performed by Dr. Rutherford only, the professor of medicine and botany. The clear-sightedness and practical sagacity which he brought to this work at once fixed his position as a teacher and as a physician. Probably, also, the fact of his having to give bedside instruction at this period opposed itself to the natural tendency of his mind to give everything a systematic form, and weeded his method of practice of an immense quantity of the scholastic rubbish which appears prominently in all the medical learning of that age. He became a decided favorite with the students, and not less so with his patients; and in 1760, was applied to by the former to undertake the lectures on materia medica, in consequence of the death of Dr. Alston during the session. This duty he performed so well, that his lectures were surreptitiously printed from the notes of a pupil, and had a considerable circulation. On the resignation of Dr. Rutherford, it was reasonably expected that C. would have been transferred from the chemical chair to that of the practice of physic, for which he had shown so decided an aptitude; but personal views interfered, and Dr. John Gregory was appointed to the practical chair. In 1766, C. was, however, placed in the chair of institutes of medicine, vacant by the death of Dr. Whytt; and Black, now the greatest chemical discoverer of the age, was brought to Edinburgh from Glasgow to fill C.'s place as professor of chem

* Thomson's *Life of Cullen*, vol. i. p. 85.

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istry. In 1773, C. was at last transferred to the chair of the practice of physic, the duties of which he had for some years performed alternately with Dr. Gregory, the latter taking part in return alternately with C. in the lectures on the theory or institutes of medicine.

Dr. Cullen died on the 5th Feb., 1790, having nearly completed his 79th year, and having been actively engaged in teaching and consulting practice till within a few months of his death. His most important works are the *First Lines of the Practice of Physic* (Edin. 1777); *Synopsis Nosologiæ Methodicæ*, 1785; *Institutions of Medicine*, 1777; *A Treatise of the Materia Medica*, 1789. Their characteristics are great clearness of expression, with remarkable soundness of judgment and common sense, rather than striking originality, or a rapid advance into new regions of thought. But he was eminently the man for his time, which was distracted and confused by a host of baseless theories, and by many of those "false facts" which C. himself said were more numerous than even false theories. Amid this farrago, he sought his way towards the truth with remarkable impartiality, and infinite candor as regards the opinions of others. His fame as one of the greatest of teachers has survived the memory of his professional success, and even the credit of his far-famed systematic nosology. His writings have been collected in 2 vols., 8vo, by Dr. John Thomson (Edin. 1827), by whom also a life was commenced, the first volume of which was published in 1832. This biography was continued by his son, and finally completed in a second volume by Dr. Craigie, in 1859.

CULLE'RA, a fortified maritime t. of Spain, on the Mediterranean, at the mouth of the Jucar, in the province, and 23 m. s.s.e. of the town, of Valencia. C. is irregularly built, but clean; has an old castle, several churches, schools, convents, a hospital, extensive barracks, etc. From its position, it is considered a place of great military importance. It stands on the outskirts of an agricultural district, "an Eden of fertility," and the inhabitants are mostly engaged in agriculture, cattle-rearing, fishing, and the production of oil and wine. A considerable coasting-trade is carried on with France and the Mediterranean. Pop. '87, 11,713.

CULLMAN, a co. in n. Alabama, formed 1877; Black Warrior river flows through it, and the Louisville and Nashville railroad intersects it; surface undulating, forests extensive. Pop. '90, 13,439. Co. seat, Cullman. Area, 577 sq. m.

CULLO'DEN, or DRUMMOS'SIE MOOR, a desolate level table-land, now partly cultivated, in the n.e. of Inverness-shire, 6 m. e.n.e. of Inverness, near the Moray firth. It is memorable as the scene of the total defeat, on 16th April, 1746, of the Highland army under prince Charles Stuart by the royal troops under the duke of Cumberland, and the extinction of the hopes of the house of Stuart to regain the English crown. Green mounds and a monumental cairn mark the spots where the battle was fiercest, and where many of the slain lie buried.

CULLOM, SHELBY MOORE, b. Ky., 1829; became prominent in Illinois politics, occupying positions in the state and national legislatures; speaker of the Ill. House of representatives, 1861 and 1873; a member of the XXXIXth and two succeeding congresses; governor of Illinois, 1876; re-elected, 1880; elected as a republican to U. S. senate, 1883, succeeding David Davis; re-elected, 1889 and 1895. He was the author of the interstate commerce law, and for many years chairman of the senate committee on interstate commerce.

CULLUM, GEORGE WASHINGTON, an American military officer, and writer on military subjects. He was born in New York, Feb. 25, 1809; graduated at the U. S. Military Academy at West Point in 1833, where he was instructor of engineering in 1848 to 1855. In 1861 he was made chief engineer of the Dept. of the Missouri, superintended engineering works on western rivers, and later was occupied for some time in Cairo, and chief engineer at the siege of Corinth. He was supt. of U. S. Military Acad., 1864–66; was brevetted major-general in 1865. He published *Systems of Military Bridges* (1863); *Register of the Officers and Graduates of the United States Military Academy* (1850). He retired from active service in 1874, and died in 1892.

CULM, in botany, the peculiar cylindrical hollow and jointed stem of grasses (q.v.).

CULM, a popular name of anthracite (q.v.), in very general use in some parts of England, and occurring in many scientific works. In some districts of South Wales, the C., obtained from the pits in a broken and crumbling condition, is used as fuel, being made up into balls, with one-third of its bulk of wet viscid clay. It burns without flame, producing a strong and steady heat, well adapted for cooking.

CULMINA'TION, an astronomical term, signifying the passage of a star across the meridian. The star is then at the highest point (*culmen*) of its course: hence the name. The sun culminates at midday, or 12 o'clock, apparent solar time—which seldom agrees exactly with mean time as shown by a watch or clock. The full moon culminates at midnight. The time of C. of a fixed star is always exactly midway between the times of its rising and setting; in the case of the sun, moon, and planets, it is only nearly so.

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CUL'NA, or KALNA, a t. of India, in the British district of Burdwan, presidency of Bengal, 42 m. n. of Calcutta, on the right bank of the Bhagirathi. The town contains a large number of temples, and has been a place of considerable trade, rice, grain, silk, and cotton being the chief articles of commerce. Pop. '91, 9700.

CUL'PA (Lat. fault, crime, blame). By the Roman jurists, C. was recognized as existing in three degrees, *C. lata*, gross carelessness or omission, which was regarded as equivalent to dole; *C. levis*, that degree of negligence into which a person attentive to his own affairs may be supposed occasionally to fall; and *C. levissima*, that still more slight degree of negligence which is in some degree incident to human nature, and may be fallen into by even the most prudent and sharp-sighted. Where a contract contemplates the mutual benefit of both parties, the middle degree of diligence is all that either is bound to exercise, and the neglect of this is *C. levis*, or C. simply. Where one party only is benefited, he is bound to exercise the utmost diligence, the neglect of which is *C. levissima*, whilst the other party has done enough if he avoids *C. lata*, or gross and excessive negligence. These distinctions of the Roman law have been adopted by the law of Scotland.

CULPABLE HOMICIDE. See HOMICIDE and MURDER.

CULPEPER, a co. in n. Virginia, between the Rapidan and Rappahannock rivers, intersected by the Southern and the Chesapeake and Ohio railroads; 322 sq. m.; pop. '90, 13,233. Agriculture is the main business. Co. seat, Culpeper.

CULPEPER, JOHN, an early English emigrant to the Carolinas who led an incipient rebellion, was tried for treason, but was acquitted because there had been really no government to rebel against. In 1680, he laid out on paper the plan of the city of Charleston.

CULPEPER OR COLEPEPPER, THOMAS, Lord, d. 1719; one of the grantees and a governor of the colony of Virginia. He administered the office chiefly for his own gain, being shrewd and unscrupulous to the last degree.

CULPRIT, in English law, is a prisoner accused, but not tried. After trial, if not acquitted, he becomes a convict.

CULROSS', a parliamentary and municipal burgh and seaport in a detached part of Perthshire, on the n. shore of the firth of Forth, 6 m. w. of Dunfermline, and 22 n.n.w. of Edinburgh. It is a place of great antiquity. As early as the 6th c., it was the seat of the monastery of St. Serf, who afterwards became the patron saint of the town, where his yearly festival was kept till about the close of the 18th century. Ængus the Keldee, an Irish martyrologist, who wrote about 800 A.D., describes it as lying in Strathearn between the Ochils and the sea of Gindan, i.e., the firth of Forth. It stands on the face of a hill rising from the shore. The parish church preserves some remains of the conventual church of a Cistercian abbey, founded in 1217, on a commanding site in the higher part of the town. Close beside it is the fine old residence of C. abbey, founded by the Bruces of Carnock and Kinloss about the end of the 16th c., remodeled about the middle of the 17th c., and towards the end of the 18th occupied by the father of the late lord Dundonald, who here made experiments in extracting tar from coal for preserving ships' bottoms, and gas for illuminating purposes. Pop. '91, less than 1500.

CULT (Lat., *cultus*, "worship," Fr., *culte*) signifies a system of religious belief and worship. A more recent use of the word is one by which it is used to express the homage paid to a great man, or to a superior mind; another name for *hero-worship*.

CULTIVATED PLANTS—those plants which, either for their usefulness or their beauty, have been to some considerable extent, and not merely as objects of curiosity, cultivated by man—belong to natural orders widely different from each other, and scattered throughout almost all parts of the vegetable kingdom. The prevalence of particular qualities in particular natural orders, indeed, causes us to find groups of C. P. in some of them, as the *cerealia* or corn-plants among grasses; but with these are botanically associated other species—usually far more numerous—to which no great value has ever been attached, or which are objects of interest to the botanist alone. It may be that, in some instances, the original preference of certain species was accidental, and that their present superiority over certain others is merely owing to the improvements effected by cultivation; but we are no more entitled to assume that this has been ordinarily the case, than that man has in his selection exhausted, or nearly exhausted, the resources of nature. Some plants are known to have been cultivated from the most remote historic ages; some have but recently become the objects of human care, which yet are deservedly esteemed; and, in some instances—e.g., sea-kale—these have not been introduced from regions newly explored, but are natives of the very countries which have been the seats of ancient civilization. Probably, in the earliest ages, plants useful for food alone were cultivated, and of these only a few kinds, as is still the case among savage tribes; it may perhaps be doubted whether plants yielding fiber for clothing and cordage, or plants from which alcoholic beverages or narcotics could be procured, were most likely next to engage attention.—Of C. P., plants affording articles of human food

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are certainly the most important, as well as the most numerous class. See FOOD. Next to these may be ranked plants yielding fiber (q.v.). Other important classes of C. P. are those yelding alcoholic beverages, all of which, however, are also to be ranked among the plants yielding food (see FERMENTED LIQUORS); those yielding tea, coffee, cocoa, and other similar beverages, containing *caffëine* (q.v.), or some analogous principle; those yielding narcotics (q.v.), as tobacco and opium, some of which are and some are not cultivated also for other purposes; those yielding dye-stuffs (q.v.); those yielding medicines (see OFFICINAL PLANTS); those yielding fixed oils (see OILS), some of which are to be reckoned among plants valuable for food, on account of the use of their oils as articles of food, whilst they are also valuable on other accounts; those yielding fodder (q.v.) for cattle; those yielding timber (see TIMBER; WOOD); those employed for hedges (q.v.), etc. There are also many miscellaneous useful products of plants, and useful purposes to which they are applicable. Among the former are resins, turpentines, essential oils, gum caoutchouc, gutta-percha, bark for tanning, etc.; among the latter, the thatching of roofs, basket-making, and the supply of food necessary for useful insects, which leads to the cultivation of the white mulberry as the food of the silkworm, and of the cochineal cactus or nopal as the food of the cochineal insect. Many plants highly valued for their usefulness are still scarcely or not at all cultivated: this is the case particularly with many that yield medicines, for which the whole demand is not too great to be easily supplied by the plants growing wild, and with timber trees, the plantation of which only takes place in countries of very advanced civilization. The number of plants cultivated for their usefulness is continually increasing, as well as of those cultivated for their beauty. The cultivation of flowers and ornamental shrubs and trees, although unquestionably less ancient than that of some of the plants most necessary for the supply of urgent wants, nevertheless dates from a remote antiquity, and has always existed in every country entitled in any measure to the credit of civilization. Some C. P. have from a very early period been very widely diffused, as has particularly been the case with some of the corn-plants; but others have been confined to particular regions through no necessity of climatic adaptation, but rather from want of intercourse among nations. Thus, some of the finest ornaments of our greenhouses and gardens, recently introduced into Europe, have been diligently cultivated from time immemorial in China and Japan, in which countries also many useful plants are cultivated still almost unknown in other parts of the world. The cultivation of useful aquatic plants is practiced in China to a degree unapproached in any other country.

The changes produced by cultivation present an interesting and difficult subject to the student of vegetable physiology. Increase of luxuriance and size is a result which might have been expected from abundant nutriment and favorable circumstances of growth; but the determination of the strength of the plant in its vegetation to particular parts, and their greater proportionate increase, is a more remarkable phenomenon, although of common occurrence, as is also the considerable modification of juices and qualities. To these effects of cultivation, perpetuated in the progeny of the plants, and increased from one generation to another, we owe many of the most useful varieties of cultivated plants. Our cabbages, turnips, carrots, etc., differ very much from the wild plants of the same species; there is little, for example, that is eatable or nutritious in the root of a wild turnip, and the acridity occasionally to be observed even in cultivation exists in it to a much greater degree. Wild celery is poisonous, or almost so. How far the effects of cultivation can be extended, is a question not yet decided in general, nor with reference to particular species. See De Candolle's *Origin of Cultivated Plants.*

CULTIVA'TION. The term includes all operations for preparing the soil for those crops which man specially selects for his use. The spade, the hoe, and the plow, have been the primary implements of C. among all nations as far back as their civilization can be traced. All these effect much the same end.

CULTIVA'TOR, a farm implement. See GRUBBER.

CULTRIROS'TRÉS (Lat. knife-billed or plowshare-billed), a tribe of birds of the order *grallatores;* distinguished by a long, thick, stout, and generally pointed and trenchant bill, and containing cranes, herons, bitterns, storks, adjutants, etc.

CULTUR KAMPF (German, "battle for civilization"). The name given in Germany to the ecclesiastical policy initiated by Prince Bismarck in 1872. The disagreement between the German government and the Roman Catholic church primarily arose from the support given by the government to those ecclesiastics who refused to accept the VATICAN DECREES (q.v.) as binding. The government denied the right of the church authorities to excommunicate any of its members without leave from the state, against which position the church opposed a vigorous protest. Another cause of dispute was the refusal of the pope to receive Cardinal Hohenlohe as German embassador, for the reason that cardinals as members of the pope's own council cannot also represent another government. The ill-feeling caused by these conflicting claims, led the Reichstag to pass a law (July 4, 1872) banishing from the empire the Jesuits as a body, and sup-

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pressing their establishments—this law being interpreted by the government as including also the Redemptorists, the Brothers of the Christian schools, and even Sisters of Charity. The salaries paid by the state to several of the bishops were also withdrawn. This action was in part imitated by Switzerland. The movement against the church was vigorously pressed for some time, but political necessities made it necessary for Bismarck to change his attitude. A church party, led by HERR WINDTHORST (q.v.), was speedily formed, and attained so important a position in the Reichstag as to make its opposition to the general policy of the government a serious obstacle. Prince Bismarck before long was obliged to secure the assent of this party to important measures by diminishing the rigor of the Cultur Kampf, until at last his concessions practically nullified the so-called Falk law. In 1878, the newly elected pope, Leo XIII., entered into negotiations with Prince Bismarck, and from that time the Cultur Kampf gradually lapsed. In 1885 the pope decorated the prince with the Order of Christ; and in 1886 Germany sent an embassador to the Vatican. In 1890 both the Emperor Wilhelm II. and Bismarck visited Rome and had a friendly interview with the pope. See POLITICAL PARTIES, GERMAN.

CUL'VERIN, among the earlier forms of cannon, was a very long gun. It was generally an 18-pounder, weighing 50 cwt.; the *demi*-C. was a 9-pounder, weighing 30 cwt. A C. of especially large dimensions is still in existence at Dover castle, where it is known by the name of Queen Elizabeth's pocket pistol. See Illus., vol. III., CANNON.

CULVERT is the name given to an arched channel of masonry for the conveyance of water under-ground.

CU'MÆ, an ancient city on the coast of Campania, founded conjointly by colonists from Chalcis in Eubœa, and from Cymæ in Asia Minor. According to Strabo, it was the earliest of all the Greek settlements either in Italy or Sicily, but the precise date of its foundation is a matter of dispute. It soon attained to wealth and power, built several harbors or port-towns of its own, kept a tolerably large fleet, extended its influence over the native tribes of the neighboring territories, planted a colony at Neapolis (Naples), and for 200 years (700–500 B.C.) was indisputably the most important and civilized city in southern Italy. Subsequently, it was repeatedly but unsuccessfully attacked by the Etruscans and Umbrians. In 474 B.C., its ally, Hieron, king of Syracuse, defeated the combined fleets of the Etruscans and Carthaginians, who had attacked it by sea. Yet there can be no doubt that these conflicts both lessened its resources and weakened its influence, for in 420 B.C., the Samnites conquered the city, murdered or enslaved the most of the citizens, and forcibly married their wives and daughters. A Samnite colony was now established in C., which rapidly degenerated into a second-rate Campanian town. In 338 B.C., it was admitted to the Roman franchise, and from this period steadily adhered to the fortunes of Rome. In the second Punic war, Hannibal tried to capture it, but was repulsed by Sempronius Gracchus. Towards the close of the republic, it became the municipal capital of the district in which the Roman nobles had their villas and sea-coast residences. It continued to exist as a "quiet" place down to the close of the Roman empire, but reassumed a momentary importance during the wars of Belisarius and Narses. Its strong fortress, garrisoned by the Goths, was the last place in Italy that held out against the Byzantine army. Few remains of the ancient city exist.—C. is famous as the residence of the Sibyl (q.v.), whose cave—a vast subterranean grotto hewn out of the eastern side of the rock on which stood the citadel—is described by Justin Martyr, who visited it. It was destroyed by Narses in a vain attempt to undermine the fortress.

CUMANA', the oldest European city in the new world, having been founded by Gonzalez Ocampo Castellon in 1520, on the abandoned site of a missionary station established eight years before. It was originally named New Toledo. It is in the province of the same name, in Venezuela, South America, and stands at the mouth of the Manzanares, on the gulf of Cariaco, a long and narrow arm of the Caribbean sea. Lat. 10° 30′ n., and long. 64° 15′ w. Though it was almost entirely destroyed by an earthquake in 1853, yet in 1891 it numbered 12,057 inhabitants. It has a good roadstead, which is commanded by a fort on an adjacent height. It has but few edifices of any note, for the houses, in order to guard against the evil already mentioned, are generally low built. It carries on a tolerably large export trade in cattle, smoked meat, salt-fish, cocoa, and other provisions.

CUMANIA, GREAT and LITTLE, districts in Hungary. Great C. is a low plain subject to inundation. Little C. has an area of 1000 sq. m. Both are now included in counties of different names.

CUMBERLAND, a river, rises in Kentucky, United States, and after a course of 600 m., of which the lower half is navigable for vessels of 400 tons, enters the Ohio at Smithland from the left, a few miles above the point where the Tennessee also joins the Ohio from the same side.

CUMBERLAND, a co. in e. Illinois, intersected by the Embarras river and several railroads; 350 sq. m.; pop. '90, 15,443. Agriculture is the main business. Co. seat, Toledo.

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CUMBERLAND, a co. in s. Kentucky, on the Tennessee border; 315 sq. m.; pop. '90, 8452, includes colored. Productions agricultural. Co. seat, Burkesville.

CUMBERLAND, a co. in s.w. Maine, on the ocean; traversed by several railroads, and bounded on the n.e. by the Androscoggin river; 1005 sq. m.; pop. '90, 90,949. The soil is fertile and well cultivated. Co. seat, Portland.

CUMBERLAND, a co. in s. w. New Jersey, on Delaware Bay; intersected by the West Jersey and the New Jersey Central railroads; 505 sq. m.; pop. '90, 45,438. Productions, chiefly agricultural. Co. seat, Bridgeton.

CUMBERLAND, a co. in North Carolina, intersected by Cape Fear river; 794 sq. m.; pop. '90, 27,321, includes colored. Lumber and turpentine are the staples. Co. seat, Fayetteville.

CUMBERLAND, a co. in s. Pennsylvania, in the Cumberland valley; traversed by several railroads; 560 sq. m.; pop. '90, 47,271. Productions agricultural. Co. seat, Carlisle.

CUMBERLAND, a co. in Tennessee; 576 sq.m.; pop. '90, 5376, with colored. It is hilly and mountainous. Co. seat, Crossville.

CUMBERLAND, a co. in central Virginia on the Appomattox and James rivers: 290 sq.m; pop. '90, 9482, includ. colored. Productions mainly agricultural. Co. seat, Cumberland.

CUMBERLAND, the north-westmost co. of England, bounded n. by Scotland and the Solway firth, w. by the Irish sea, s. by Lancashire, e. by Westmoreland, Durham, and Northumberland. It is eleventh in size of the English counties; greatest length, 74 m.; greatest average breadth, 22; 75 m. of coast: area, 1516 sq.m.; ¾ being cultivated, and ¼ in mountain and lake. The surface is mountainous in the s.w. and e.; the middle consists of hills, valleys, and elevated ridges; and the n. and n.w. districts, including the vale of Carlisle, are low, flat, or gently undulated. The mountains in the s.w. are high, rugged, and sterile, with deep and narrow valleys, lakes, rivers, water-falls, and woodlands. The chief mountains are Sca Fell Pike, 3,210 ft.; Sca Fell, 3,162; Helvellyn, 3,118; Skiddaw, 3,054. From the latter are seen the German ocean and the Irish sea. The Pennine chain, the great backbone of the n. of England, skirts the n.e. border of C., and rises in Cross Fell, 2,929 feet. C. has 15 lakes, the largest one, Ullswater, being 9 m. by 1. Six of the chief water-falls are 60 to 156 ft. high. The chief rivers are the Eden, running 35 m. n.w. into the Solway firth; the Esk, running s. into the same; and the Derwent, which collects the water of six lakes and several tarns, and runs 33 m. n.w. and n. into the Irish sea. The great west or Carlisle and Lancaster railway route from Edinburgh to London, crosses the n.e. part of Cumberland.

The lake district, or nearly the s.w. half of C., consists of Silurian slates, with protrusions of granite and trap rocks, and with new red sandstone along the coast s. of St. Bees Head. In the n. is a semicircular strip of carboniferous limestone; then follow strips of coal strata and permian rocks; then the new red sandstone plain of Carlisle, with carboniferous limestone on the n.e., including a trap-dike 30 m. long, parallel to and on the e. side of the Eden, and crossing to the w. near Ainstable. C. abounds in mineral wealth—silver, copper, lead, iron, plumbago, gypsum, limestone, coal, slates, marbles, marl, and several of the more rare minerals. The chief mining centres are Harrington, Maryport, Whitehaven, Cleator Moor and Workington.

In the mountainous parts, the climate is cold, wet, and variable, especially from July to Oct.; on the coast it is mild. There is a fall of 50 in. of rain annually at Whitehaven, and of 68 at Keswick; while at some places among the mountains the fall sometimes reaches 100 inches. Half of the cultivated soil consists of dry loam. Much of the subsoil is wet clay. The chief crops are wheat, barley, oats, turnips, and potatoes. There are many small dairies. Many sheep and cattle are reared in the mountains. The estates are generally small, and farmed by the owners, or held under the lords of the manors by customary tenure. Many of the small or peasant proprietors have had their lands in their families for centuries, and have a high spirit of independence. There are manufactures of woolens—much being domestic—cottons, linen, earthenware, and glass. C. is divided into wards or hundreds, parishes, and poor-law unions. The chief towns are Carlisle, Cockermouth, Whitehaven, Workington, Maryport, Wigton, Penrith, Keswick, Egremont. It comprises the parliamentary divisions of Eskdale (Northern), Penrith (Mid), Cockermouth, and Egremont (Western), and two parliamentary boroughs, Carlisle and Whitehaven. Pop. '91, 266,550. C. formed part of Cumbria (q. v.). Many Roman relics have been found, such as altars, inscriptions, coins, instruments, utensils. During Saxon times, it was under Danish law. Henry III. united it to England. For three centuries before the union of England and Scotland, C. was the constant scene of war and devastation, from incursions of the English and Scotch into this, a debatable tract between the two kingdoms. It was again devastated in the civil wars of the 17th c., and in 1715 and 1745. C. had formerly several monasteries and hospitals; and on the borders, many towers or peel-houses; and it has still some old Norman and Gothic churches.

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CUMBERLAND, a co. in Nova Scotia; 1600 sq. m. pop. '91, 34,529. Bituminous coal-mining, agriculture, lumbering, and shipbuilding constitute the chief branches of industry. Chief town, Amherst.

CUMBERLAND, a town in Providence co., R. I., on Blackstone river, and New York, New Haven and Hartford railroad; 6 m. n. of Providence, containing extensive manufactories of horse-shoes, cotton, etc.; incorporated 1746–7. Pop. '90, 8090.

CUMBERLAND, city and co. seat of Alleghany co., Md.; on the outer edge of the great Cumberland coal region, and the shipping point via the Chesapeake and Ohio canal, for the vast quantities of semi-bituminous coal produced in that vicinity. It is in a remarkably picturesque locality on the Potomac river some 600 or 700 ft. above the river, and is entered by the Pennsylvania, the Baltimore and Ohio, and other railroads. The entrance to the city is specially beautiful, and displays to great advantage the amphitheatre-like valley in which it lies. There are extensive rolling-mills for the manufacture of steel-rails, bars, and other railroad iron; iron foundries, steel works, railroad car and repair shops, glass-works, and flour and cement mills; numerous churches, public and private schools, Holly system of waterworks, national banks, and daily, weekly, and monthly periodicals. Pop. '80, 10,693; '90, 12,729.

CUMBERLAND, RICHARD, D.D., was b. in London, July 15, 1631. Educated at St. Paul's school and at Cambridge, he was appointed to the rectory of Brampton, Northamptonshire, in 1658; in 1667, to the living of All Hallows, Stamford; and in 1691, to the bishopric of Peterborough. C. was a man of great acquirements and piety. He was the author of several works, but he is now chiefly remembered on account of his *Inquiry into the Laws of Nature*, issued in reply to Hobbes; and his *Essay on Jewish Weights and Measures*. As an instance of his insatiable thirst for knowledge, it is mentioned that he learned Coptic after the age of 83. He died, Oct. 9, 1718.

CUMBERLAND, RICHARD, a dramatic writer and essayist, was b. on the 19th Feb., 1732, in the lodge of Trinity college, Cambridge. He was the great-grandson of the bishop of Peterborough, and grandson, by the mother's side, of Dr. Richard Bentley. He was placed at the public schools of Bury St. Edmunds and Westminster, and at the age of 14, was entered at Trinity college, Cambridge, where he took his degree in his 18th year, and two years after was elected fellow. Having been appointed private secretary to the earl of Halifax, he gave up his intention of entering the church, and passing through several subordinate offices, was appointed secretary to the board of trade, holding that office till 1782, when the board was suppressed. Having obtained a compensation allowance, C. retired to Tunbridge Wells. Here he devoted himself to literature, and wrote farces, tragedies, comedies, pamphlets, essays, and novels. Many of his comedies were successful at the time of their appearance, although they have not kept possession of the stage. C. is best known as an essayist, and as a translator from the Greek poets. His memoirs were published in 1806, and he died in 1811.

CUMBERLAND, WILLIAM AUGUSTUS, Duke of, second son of George II., was b. in 1721. He adopted a military career, was wounded at Dettingen in 1743, and defeated at Fontenoy by Marshal Saxe in 1745. In 1746 he defeated the young Pretender at Culloden. In 1747 he was again defeated by Saxe (at Lafeldt) and in 1757 had to surrender and disarm his army at Klöster-Zeven. On his return to England he felt compelled to resign his commissions, and died in 1765. See *Life* (1776) and *General Orders of* 1745–47 (1876). The latter seems to show that his severity after Culloden has been exaggerated. Lord Macaulay has summed up his character in the following words: "With great courage he had the virtues which are akin to courage. He spoke the truth, was open in enmity and friendship, and upright in all his dealings; but his nature was hard, and what seemed to him justice was rarely tempered with mercy."

CUMBERLAND GAP, a pass through the mountains between Kentucky and Tennessee; an important strategic position in the late civil war.

CUMBERLAND ISLAND, a large island with Davis strait on the e., Hudson bay on the w., Hudson strait on the s., and on the w. a small strait separating it from Cockburn island.

CUMBERLAND MOUNTAINS, a spur of the Appalachian chain, partly in s.e. Kentucky, though the main portion is in Tennessee. Its formation is coal, slate, and carboniferous limestone. It is a plateau in places nearly 2000 ft. above tide, and nearly 50 m. in width, with steep descent on both sides. A few hills in the plateau rise 700 or 800 ft. higher. There are some valuable coal mines, and the main portion is well timbered with white ash, hickory, chestnut, etc.

CUMBERLAND PRESBYTERIANS, a religious denomination having its origin in a revival of religion which commenced in 1797 in the s. western part of Kentucky, under the preaching of Rev. James McGready, a Presbyterian of Scotch-Irish descent, who had

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been educated at Jefferson college in western Pennsylvania. The revival, at first, was of slow progress, but soon received a great impulse, and became one of the most important religious movements in the United States, as it did much to establish faith in Christianity among the people of the Mississippi valley. The number of congregations into which the converts were organized was so large that it was impossible to supply them with ministers educated in the thorough manner usually required by the Presbyterian church, and, by advice of Rev. David Rice (q.v.), several young men of good abilities and earnest piety were encouraged to prepare themselves by a shorter course. Three of them applied for licensure to the presbytery of Transylvania, but exception was taken both to their limited education and their opinions concerning the doctrines of the atonement and the divine decrees. They were, however, licensed, and, soon after, were set off to the presbytery of Cumberland (formed, 1802, by a division of the presbytery of Transylvania), and two or three of them were ordained by it. This independent action caused great discussion, and in 1805 the synod of Kentucky appointed a committee to inquire into the matter. Its first demand was that those who had been licensed or ordained should submit to a re-examination. This they refused to do, and were, therefore, prohibited from exercising their ministry until they complied with the demand. They who had been thus proscribed, and the members of presbytery who supported them, in Dec., 1805, organized themselves into a council for the management of their own church and revival work. They sent a memorial to the general assembly, but that body sustained the synod, yet directed it to review its proceedings. On complying with the direction, the synod confirmed what had been done, and in 1806 dissolved the Cumberland presbytery and re-annexed to the presbytery of Transylvania the members who had not seceded. After a fruitless attempt at reconciliation, the 2 ministers who had been silenced, Finis Ewing and Samuel King, together with Samuel McAdow, who had aided them in their "irregularities," organized, Feb., 1810, an independent body under the old name of the Cumberland presbytery. From that time the progress of the movement was much more rapid than its originators looked for; and though the churches starting from it spread both east and west, the local name, Cumberland Presbyterians, continued to be applied to them In 1813 the presbytery was divided into 3, and the Cumberland synod was constituted. In 1816 an edition of the Westminster confession and catechisms was published, altered to suit their system, which tried to steer between Calvinism and Arminianism. It rejected the doctrines of eternal reprobation, limited atonement, and special grace, teaching that the operation of the Holy Spirit is co-extensive with the atonement. Revivals and camp-meetings are earnestly advocated. In May, 1884, 27 synods were reported, extending from the lakes to the gulf, and from the Appalachian mountains to the Pacific, and comprising 116 presbyteries, 1505 ministers, 249 licentiates, 214 candidates, 2462 congregations, 9373 elders, 3104 deacons, 122,240 communicants, 55,541 persons in Sunday-schools. The value of church property reported was over $2,000,000; the amount of contributions for the year, $500,000. In 1894 126 synods were reported, 1708 ministers, and 184,138 communicants. The chief institutions of learning are the Cumberland univ., founded in 1826 at Princeton, Ky., and removed in 1842 to Lebanon, Tenn., and having the leading law school of the south; also a theological school; Coll. of West Tennessee; Bethel College, Tenn.; Lincoln univ., Ill.; Trinity univ., Texas; and Missouri Valley College, Mo. The Board of publication is at Nashville, Tenn., and the board of missions at St. Louis. The first denominational newspaper was published at Princeton, Ky., in 1830. There is a separate organization of colored members of the denomination. See Cossit's *Life and Times of Finis Ewing* (Nashville, 1853); Davidson's *History of the Presbyterian Church in Kentucky* (N. Y., 1847); Crisman's *Origin and Doctrines of the Cumberland Presbyterian Church* (Nashville, 1871).

CUMBERLAND AND TEVIOTDALE, Duke of, titles borne by the son of the late king of Hanover, a prince of the blood-royal of Great Britain, and first cousin of queen Victoria.

CUMBERLAND UNIVERSITY. See LEBANON, TENN.

CUM'BRAYS, or GREAT and LITTLE CUMBRAY, two small isles in the firth of Clyde, between Bute isle and Ayrshire, and included in the county of Bute. They consist of old red sandstone, with trap-dikes intersecting it. Great Cumbray lies 8 m. e. of Bute, is 3½ m. long by 2 broad, contains Millport and Newton villages, and is a great summer resort of the inhabitants of Glasgow. Little Cumbray lies nearly a mile to the s. of Great Cumbray, is one mile long by half a mile broad, and rises 780 ft.; it contains many caves, excavated by the sea in the stratified rocks.

CUM'BRÉ, LA, the Spanish for top or height, is one of the principal passes across the Andes, on the high-road between Santiago in Chili and Mendoza in the Argentine republic. The altitude of its crest is 12,454 ft., fully one-half higher than the pass of the Great St. Bernard in the Alps.

CUM'BRIA, an ancient British principality, comprising Cumberland in England, and that part of Scotland which is now divided into the shires of Dumbarton, Ren-

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frew, Ayr, Lanark, Peebles, Selkirk, Roxburgh, and Dumfries. It was governed by its own kings—who had their seat at Dumbarton, Glasgow, and elsewhere—until about the middle of the 10th c., when it became a tributary principality held of the king of the English, by the heir of the king of the Scots. See the article BRETTS AND SCOTS.

CUM'BRIAN MOUNTAINS, a great knot of mountains, nearly 50 m. in length and breadth, in the n.w. of England, occupying part of Cumberland, Westmoreland, and Lancashire. This tract, the English lake district, has much of the physical character of Wales, and being unsurpassed in the British isles for picturesqueness and beauty, it is much frequented by tourists. The central and southern parts consist of Silurian, granite, and trap rocks, rising in lofty rugged mountains, which inclose deep valleys and large lakes. There are 25 mountain-tops upwards of 1500 ft. high, including Sca Fell Pike, 3,210 ft.; Sca Fell, 3,162; Helvellyn, 3,118; and Skiddaw, 3,054. Four passes cross these mountains at the height of from 1100 to 1250 feet. The deep valleys between the mountains contain 14 lakes, 1 to 10 m. long. The largest of the lakes are Windermere, Ulleswater, Conistone Water, Bassenthwaite Water, and Derwentwater. A semicircular strip of carboniferous limestone skirts the n. of the Silurian tract. On the higher C. M., snow lies six or eight months in the year, but on the neighboring coasts rarely above a few days. Many eminent persons have resided among the lakes, the beauty of which has inspired some of the finest writings of Wordsworth, Coleridge, Southey, Prof. Wilson, De Quincey, Arnold, and Harriet Martineau.

CUMIA'NA, a t. of north Italy, in the province of Turin, 7 m. n. of Piñerolo, near the right bank of the Cisola. Pop. 5,700.

CUMING, a co. in n.e. Nebraska, crossed by the Fremont, Elkhorn, and Missouri Valley railroad; 576 sq. m.; pop. '90, 12,265. Agriculture is the chief business. Co. seat, West Point.

CUM'MIN, or CUM'IN, *Cuminum*, a genus of plants of the natural order *umbelliferæ*, containing only one known species (*C. cyminum*), a native of Egypt and the neighboring countries; an annual, with branched stem, much divided thread-like leaves, general and partial involucres resembling the leaves, umbels of small white or pink flowers, and fruit about two lines long. The fruit (seeds) has an odor resembling that of caraway, but stronger and less pleasant. It is employed as a carminative in many parts of the world; in Germany, it is often put into bread; in Holland, sometimes into cheese. It is also used in medicine, particularly with resin for discutient plasters, but its use is now chiefly confined to veterinary practice. It contains a peculiar volatile oil (*oil of cummin*). C. is cultivated in the s. and middle of Europe, India, etc. C. seed is brought to Britain mostly from Sicily and Malta.—The fruit of *lagoecia cuminoides*, another umbelliferous plant, a native of the Levant, is similar in its qualities and uses to that of cummin. The BLACK C. of the ancients is believed to be a species of *nigella* (q.v.). Both are perhaps included in the name C. in Scripture.

CUM'MING, JOHN, D.D., a popular preacher and author, was b. Aberdeenshire, 10th Nov., 1807; educated at King's college, Aberdeen, where he took his degree of M. A. in 1827, and, in 1833, was ordained to the Scotch church, Crown Court, Covent Garden, London, officiating till about 1880. His popularity as a preacher was very great, especially among "fashionable" circles. In 1837, C. made his first prominent appearance in public in connection with the voluntary controversy between Drs. Wardlaw and Chalmers. His views were strongly in favor of establishments. Afterwards Dr. C. figured prominently on the platform, particularly as the "champion" of the anti-popery class of Protestants. But the chief source of his popularity was his gift of apocalyptic interpretation. His exposition of the book of Revelation though not convincing to men who are moderately impressed with the grandeur, complexity, and mystery of the divine Providence; but was greatly relished, and greedily swallowed by that large portion of the community who love to see all things, even the "oracles of God," presented under melodramatic aspects. He d. 1881.

C.'s works are very voluminous: the chief are *Voices of the Night; Voices of the Day; Voices of the Dead; Apocalyptic Sketches; Expository Readings in the Old and New Testament;* and *The Seventh Vial.*

CUMMING, ROUALEYN GORDON, 1820–66; the "lion hunter;" a Scotchman, educated at Eton, who served in the English army in India. In 1843, he began his five years of a hunter's life in South Africa, where he had many remarkable experiences.

CUMMINGS, JOSEPH, D.D., LL.D., 1817–90; b. Falmouth, Me.; educator. He was president of Wesleyan University, Middletown, Conn., in 1857–75; professor of mental philosophy and political economy there in 1875–77; and president of Northwestern University, Evanston, Ill., from 1881 till his death.

CUMMINGTON, a t. in Hampshire co., Mass., on the Westfield river; pop. '90, 787. The poet William Cullen Bryant was born here, and the Bryant Free Library is here.

CUMMINS, GEORGE DAVID, D.D., b. Del., 1822; graduated at Dickinson college; entered the Methodist ministry; took orders in the Episcopal church, 1845; rector of several Episcopal churches in Virginia, Washington and Chicago. He was chosen

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assistant bishop of Kentucky, 1866. In 1873 he resigned this position; and, withdrawing from the denomination, founded the Reformed Episcopal Church, of which he was made bishop, 1873. He was an earnest and eloquent preacher. He d. 1876.

CUMMINS, MARIA SUSANNA, 1827–66; b. Mass., known as a writer of works of fiction, among them, *The Lamplighter* and *Mabel Vaughan*.

CUM'NOCK, OLD, a t. in the s.e. of Ayrshire, on the left bank of Lugar Water, and on the Glasgow and Dumfries railway, 16 m. e. of Ayr, in the middle of the district of Kyle. The pop., in 1881, was 3345.

CUMULATIVE VOTING. A system of voting practised in the Illinois House of Representatives, and to some extent in British elections. Each voter has the same number of votes as there are candidates for a given office, or within one of the same number, and can distribute his votes, or give them all to one candidate, at his pleasure. It constitutes a so-called proportional, or minority representation. The same principle was adopted as the basis of its election law, by Michigan, in 1889; and though considered by some unconstitutional, was sustained by the Supreme Court in 1891.

CUMULUS. See headings, CUMULUS, CIRRO-CUMULUS, CUMULO-STRATUS and NIMBUS, under the article CLOUDS.

CUMYN, CUMMING, or COMYN, a family which rose to great power and eminence in England and Scotland. It took its name from the town of Comines, near Lille, on the frontier between France and Belgium. While one branch remained there, and, in 1445, gave birth, in its old château, to the historian Philippe de Comines (q.v.), another followed the banners of William of Normandy to the conquest of England. In 1069, the conqueror sent Robert of Comines, or Comyn, with 700 horse to reduce the yet unsubdued provinces of the north. He seized Durham, but had not held it for 48 hours, when the people suddenly rose against him, and he perished in the flames of the bishop's palace. His nephew, William, became chancellor of Scotland about 1133, and, nine years later, all but possessed himself of the see of Durham. The chancellor's nephew, Richard, inherited the English possessions of his family, and acquired lands in Scotland. By his marriage with Hexilda, countess of Athol, the granddaughter of Donald Bane, king of the Scots, he had a son William, who, about 1210, became earl of Buchan by marrying the Celtic heiress of that great northern earldom. By this marriage, he was father of Alexander, earl of Buchan, who, by marrying a daughter of Roger de Quenci, earl of Winchester, acquired the high office of constable of Scotland, with great estates in Galloway, Fife, and the Lothians. By a previous marriage with a wife whose name has not been ascertained, William C. was father of Richard—whose son John became lord of Badenoch—and of Walter, who by marriage became earl of Monteith. By other marriages, the family obtained, for a time, the earldom of Angus and the earldom of Athol, so that, by the middle of the 13th c., there were in Scotland 4 earls, 1 lord, and 32 belted knights of the name of Cumyn. Within 70 years, this great house was so utterly overthrown that, in the words of a contemporary chronicle, "there was no memorial left of it in the land, save the orisons of the monks of Deer" (a monastery founded by William C., earl of Buchan, in 1219). The Cumyns perished in the memorable revolution which placed Bruce on the throne of Scotland. Their chief, the lord of Badenoch, had, in 1291, been an unsuccessful competitor for the crown, as a descendant, through king Donald Bane, of the old Celtic dynasty. His son, Red John C., was one of the three wardens of Scotland, and distinguished himself by his gallant resistance to the English. He fell under Bruce's dagger, before the altar of the Franciscan friars at Dumfries, in 1306; and his kindred went down, one after another, in the struggle to avenge him. John C., earl of Buchan, was defeated by Bruce in a pitched battle, near Inverury, in 1308, when his earldom was wasted with such relentless severity, that—we are told by the poet who sang the victories of Bruce—for sixty years afterwards, men mourned the desolation of Buchan. Such of the Cumyns as escaped the sword, found refuge, with their wives and children, in England, where, although they were so poor as to be dependants on the bounty of the English court, they married into the best families, so that, in the words of Mr. Riddel, "their blood at this day circulates through all that is noble in the sister kingdom."

CUNARD, Sir SAMUEL, 1787–1865; an English engineer, the founder of the Cunard line of ocean steamers plying between England and America. He was made a baronet in 1859.

CUNAX'A, a place in Babylonia, on the eastern bank of the Euphrates, about 60 m. n. from Babylon, noted for the battle fought there (401 B.C.) between Cyrus the younger and his brother Artaxerxes Mnemon, in which the former was killed.

CUNCTATOR, QUINTUS FABIUS MAXIMUS VERRUCOSUS, THE DELAYER. See FABIUS.

CUNDINAMAR'CA, the central department of the United States of Colombia (formerly New Granada), has an estimated area of from 79,000 to 92,000 sq. m. The western portion is mountainous, intersected by luxuriant valleys; in the e. are vast plains. The state of C. is well timbered and rich in minerals, and produces all the crops grown in other parts of Colombia. The population appears to be equally divided between whites, aborigines, and half-breeds, and was in 1881 estimated to consist, inclusive of the Indians, of 569,000 souls. Bogota, the capital of the state of C., is also the capital of the

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United States of Colombia (q.v.). C. derives its name from an old American goddess, and before the conquest of the land by the Spaniards was one of the chief regions of native civilization. There are still to be met with here ruins of old buildings, broken statues of the gods, and other monuments of a worship that has wholly passed away.

CUNDURAN'GO, a vine growing in n. South America, containing a strong bitter principle. It was at one time supposed to be valuable in the cure of cancer, and was sold in the United States at enormous prices. But it was worthless, and cargoes of it were used for fuel.

CUNE'IFORM, cuneatic, wedge-shaped, arrow-headed (Fr. *tête-à-clou*, Ger. *keilförmig*), are terms for a certain form of writing, of which the component parts may be said to resemble either a wedge, the barb of an arrow, or a nail. It was used for monumental records, and was either hewn or carved in rocks and sculptures, or impressed on tiles and bricks. The first date that can be assigned to it is about 2000 B.C., and it seems to have died out shortly before or after the reign of Alexander the Great. It appears to have been employed first in Assyria and Media, and to have thence spread over the whole of that vast portion of Asia which formed the Persian monarchy under the Achæmenidæ. For nearly 2,000 years after its extinction its very existence was forgotten. Although the immense ruins found all over that ancient kingdom, and principally those of splendid palaces and tombs, which, at a distance of about 12 m. from Shiraz, designate the site of ancient Persepolis, had at all times attracted the attention of eastern travelers, still no one seems to have dreamed that those strange wedges which completely covered some of them could have any meaning. It was Garcia de Sylva Figueroa, ambassador of Philip III. of Spain, who, on a visit to Persepolis in 1618, first became possessed with the firm conviction that these signs must be inscriptions in some lost writing and, perhaps, language, and had a line of them copied. Amongst subsequent travelers whose attention was attracted to the subject, Chardin, after his return to Europe in 1674, published three complete groups of cuneiforms, copied by himself at Persepolis, together with a comparatively long and minute account of the mysterious character. He likewise declared it to be "writing and no hieroglyphs: the rest, however, will always be unknown." Michaux, a French botanist, sent, in 1782, an entire altar, found at Bagdad, to Paris, covered with inscriptions, and bearing a large wedge—evidently an object of worship—on its top. Ever since, the materials for the investigation of a subject, the high importance of which by that time was fully recognized, have been rapidly accumulating. Sir H. Jones, Ker Porter, Robert Stewart, sir W. Ouseley, Bellino, Dr. Schultz—up to Rich and Botta, Flandin, Rouet, Layard, Oppert, and, above all, Rawlinson, each in his turn brought back more or less valuable materials from his eastern travels; and, naturally enough, those explorers are among the foremost to engage in the study of the records they had brought to light.

Shrouded in comparative mystery though certain portions of these characters and the language they represent still be, it is highly interesting and instructive to notice the opinions first entertained of them by the wise and learned in Europe. In the transactions of the royal society of June, 1693, they first appeared from a copy made by Plowers, and they are held to be "the ancient writing of the Gaures or Gebres, or a kind of *telesmes*"—an expression no less unintelligible than the subject it tries to explain. Thomas Hyde, the eminent orientalist, declared them, in his learned work on the religion of the ancient Persians, which appeared in 1700, to be nothing more or less than idle fancies of the architect, who endeavored to show how many different characters a certain peculiar stroke in different combinations could furnish, and reproved the authors of all those "so-called Persepolitan inscriptions" very strongly for having misled so many wise men, and taken up so much of his own precious time. Witte, in Rostock, saw in them the destructive work of generations upon generations of *worms*. Generally, they were pronounced to be talismanic signs, mysterious formulæ of priests, astrological symbols, charms, which, if properly read and used, would open immense vaults full of gold and pearls—an opinion widely diffused among the native *savants*. The next step was to see in them a species of revealed digital language, such as the Almighty had first used to Adam. Lichtenstein read in some of them certain passages from the Koran, written in Cufic, the ancient Arabic character; in others, a record of Tamerlane; and was only surprised that others should not have found this, the easiest and clearest reading, long before him. Kæmpfer was not quite sure whether they were Chinese or Hebrew characters. That they were Runes, Oghams, Samaritan, Greek characters, were some of the soberest explanations.

It was Karsten Niebuhr who first showed the way, to the more sensible portion of the learned, out of this labyrinth of absurdities. Without attempting to read the character itself, he first of all established three distinct cuneiform alphabets instead of one, the letters of which seemed to outnumber those of all other languages together. The threefold inscriptions found at Persepolis he thus took to be transcripts of the same text in three alphabets, in a hitherto unknown language. Tychsen of Rostock (1788), and Münter of Copenhagen (1800), affirmed and further developed this conjecture. The latter went so far as to divide the characters and inscriptions into alphabetical, syllabic, and monogrammatical, and to assume two different languages—Zend for inscriptions of

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a religious, Pehlvi for those of a political character. The real and final discovery, however, is due to Grotefend of Hanover, and dates from 1802. On the 7th of Sept. of that year, he laid the first cuneiform alphabet, with its equivalents, before the academy of Göttingen—strangely enough, in the very same sitting in which Heyne gave an account of the first reading of hieroglyphs. The process by which Grotefend arrived at that wonderful result is so supremely interesting, that we cannot omit to sketch it briefly. He fixed upon a Persepolitan inscription of what was called the first class, and counted in it thirty promiscuously recurring groups or combinations of cuneiforms. These groups he concluded to be letters, and not words, as a syllabarium of thirty words could not be thought of in any language. Then, again, a certain oblique wedge, evidently a sign of division, which stood after three, four, five, up to eight or nine such groups or letters, must show the beginning or end, not of a phrase, but of a word. Tychsen and Münter had already pointed out a certain combination of seven characters as signifying the royal title. Grotefend adopted this opinion. The word occurred here and there in the text, and after the first words of most of the inscriptions, twice; the second time with an appendage, which he concluded to be the termination of the genitive plural, and he translated these two words without regard to their phonetic value, "king of kings." He then, in comparing the words preceding the royal titles in two tablets, found them repeated in what he assumed to be a filial relation; thus: There were three distinct groups, words, or names, which we will call X, D, and H, and this is how they occurred: 1, X, king of kings, son of D., king of kings; 2, D, king of kings, son of H; but the 3, H, was *not* followed by the word king. H, therefore, must have been the founder of the dynasty. Now the names themselves had to be found. Grotefend, unlike his predecessors, had no recourse to philology, but to archæology and history. The inscriptions in question were by that time proved to belong to the Achæmenian dynasty, founded by Hystaspes = group H. He was followed by Darius, "king of kings, son of Hystaspes," or Darius Hystaspis = group D; he, again, by Xerxes, king of kings, son of Darius, king of kings = group X—and the problem was solved. It could not have been Cyrus and Cambyses, as the groups did not begin with the same signs (C); nor Cyrus and Artaxerxes, the first being too short for the group, the second too long—it could only be Darius, Xerxes, Hystaspes—of course, in the orthography of their, not of our time; and wherever in these names the same letters recurred, they were expressed by the same combinations of signs. A further proof of the correctness of the reading was furnished by a vase in Venice, bearing a cuneiform and a hieroglyphical inscription, which were both read at the same time independently: "Xerxes." Innumerable difficulties, however, remained, and remain, up to this moment. Grotefend had, after all, only read—and not altogether correctly—three names, which did not contain more than 12 letters—the rest being mere conjecture—and there were many more in this alphabet. The two other alphabets, with an infinite variety of letters, had hardly been properly approached yet. Moreover, the discovery of Grotefend was in itself so startling, so extraordinary and bold, that no one ventured to follow it up for the next 20 years, when H. Martin found the grammatical flexions of the plural and genitive case. We cannot now specify his further discoveries, or those of Rask, Burnouf, Lassen, Westergaard, Beer, Jacquet, and others who followed; we will only say, that they mostly secured for themselves fame and name by rectifying or fixing one or two letters. The last and greatest of investigators of this first alphabet is Rawlinson, who not only first copied, but also read, the gigantic Behistun inscription—containing more than 1000 lines—of which more anon.

We now proceed to give what may be called the results of the investigations of the cuneiform character in general, up to this present moment; but we must warn the reader beforehand, that though much has been done, more remains to be done, and that a few years may change the whole aspect of cuneiform studies.

Cuneiform writing, as we said before, was used for monumental records only, a cursive writing—from right to left—being used for records of minor importance. The inscriptions are mostly found in three parallel columns or tablets, and are then translations of each other in different alphabets and languages, called respectively Persian, Median, and Assyrian; the Achæmenian kings being obliged to make their decrees intelligible to the three principal nations under their sway, as in our days the shah of Persia would use the Persian, Turkish, and Arabic languages, in order that he might be understood in Bagdad and Teheran.

The first of the three, the Persian—first in so far as it always holds the place of honor—consists of 39 to 44 letters, and is the most recent of the three, the most ancient being the Assyrian. It is distinguished by the oblique stroke which divides its words. Its letters are composed of not more than five strokes or wedges placed side by side horizontally or perpendicularly, or both, never—with one exception—crossing each other. The language is pronounced by all investigators (save Gobineau), to be as near Sanscrit as possible, although not so refined, and to be the mother-language of modern Persian. It is only twice found by itself; all the other inscriptions are trilingual. The time of its use is confined to the years 570–370 B.C. The oldest instance of its employment is an inscription of Cyrus the great at Pasargadæ; the most recent that of Artaxerxes Ochus at Persepolis. The most important is that of Darius Hystaspis, in the great inscription of Behistun, which contains, besides genealogical records, a descrip-

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tion of the extent of his power, the leading incidents of his reign, prayers to Ormuzd and the angels, and reference to the building of the palaces—the last two subjects generally forming the only contents of the other Persian inscriptions. The inscription of Artaxerxes Ochus is important, in so far as it traces his origin to the Achæmenidæ, through Arsames, grandfather of Darius. Most of these inscriptions occur at Persepolis, Behistun, Naksh-i-Rustam, and Hamadan.

The second kind is called the Median, because it takes the second place in the trilingual inscriptions, under the conquering Persians, but over the conquered Assyrians, and as the Medes stood somewhat in that relation to these two nations, that name was selected. Another name, "Scythic," has been proposed, or, by way of compromise. "Medo-Scythic," and the language—supposed to have been spoken by those innumerable Tartaro-Finnic tribes which occupied the center of Asia—has been pronounced to be a Turanian dialect. But the process of constructing out of such slender elements as Samojed and Ostiak words, a so-called "Scythic," is somewhat similar to the attempt of reconstructing Sanscrit from some detached and very doubtful French and English words. These inscriptions never occur by themselves (one instance again excepted), and being translations of the Persian records, about ninety names have been ascertained, and an alphabet of about 100 characters—combinations of a syllabic nature—has been established. The principal investigators of this character are Westergaard, De Saulcy, Hincks, Norris, and Oppert. Gobineau holds the language to be Huzvaresh, a mixture of Iranian and Semitic.

The third and most important is the Assyrian portion of the cuneiforms. The trilingual records gave the first clue to the deciphering of this character; but many original, more than a thousand years older, documents have since been found in Babylon, Nineveh, and other places near the Euphrates and Tigris, and even in Egypt. About 400 different signs have been distinguished on slabs, cylinders, barrels, prisms, of a phonetic, syllabic, and ideographic nature. Proper names are preceded by monograms, which give the same help to their readings as cartouches in hieroglyphics. Of those 400 signs, however, hardly one tenth are known for certain. Proper names were found varied to about five times, and the characters themselves are both homophonous (same sound expressed by various signs) and polyphonous (same sign with various sounds). Five and more dialects have been distinguished in the language, which is decidedly Semitic (Gobineau takes it to be simply Arabic); and these dialects are supposed to have belonged either to different tribes or subsequent periods. It is this alphabet about which the greatest uncertainty and confusion prevail, for endless subdivisions, and even certain assumed grammatical forms, do not constitute a certainty. There is, however, a hope of its eventually being fully deciphered. A few years ago, the Asiatic society submitted a cylinder of Tiglath-Pileser to four prominent investigators of the subject, and they independently read it nearly alike, with exception of the proper names, where they widely differed. As a proof of the enormous importance of this character for history, grammar, law, mythology, archæology, and antiquities generally, we will name some of the records of which Rawlinson, a few years ago, proposed the publication (now in progress): Chaldean legends (2,000–1500 B.C.); bricks from Kilehsergat, of the early kings of Assur (1273–1100), in a character approaching the cursive; annals of Tiglath-Pileser I. (1120 B.C.); annals of Sardanapalus, of Shamas, father to the biblical Pul, of the biblical Pul and Semiramis, his wife, of Sargon, Sennacherib, Assurbani-Pal, son of Esarhaddon; cylinder of Nebuchadnezzar; cylinders containing the notice of Belshazzar, etc.; besides syllabaries, vocabularies, mathematical and astronomical tablets, calendars and registers, and more than 1000 mythological tablets. Nay, if the Birs-Nimrud really stands on the foundations of the old tower of Babel, we might in the bricks excavated at these very foundations read the language spoken at the time "when the whole earth was of one speech."

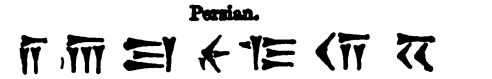
As to the origin of the character, we will briefly state, in conclusion, that nothing certain is known, or is likely to be known for some time. It is not unlikely, however, that it was hieroglyphic, although neither the fishes nor the bees, which these letters are supposed to have been originally, seem to have more in their favor than the worms, which were said to be their unconscious authors. The following is the opinion of Rawlinson on this point: "That the employment of the cuneiform character originated in Assyria, while the system of writing to which it was adapted was borrowed from Egypt, will hardly admit of question. Whether the cuneiform letters in their primitive shapes, were intended like the hieroglyphs to represent actual objects, and were afterwards degraded to their present forms; or whether the point of departure was from the Hieratic, or perhaps the Demotic character, the first change from a picture to a sign having thus taken place before Assyria formed her alphabet, I will not undertake to decide; but the whole structure of the Assyrian graphic system evidently betrays an Egyptian origin. The alphabet is partly ideographic and partly phonetic, and the phonetic signs are in some cases syllabic, and in others literal. Where a sign represents a syllable, I conjecture that the syllable in question may have been the specific name of the object which the sign was supposed to depict; whilst in cases where a single alphabetical power appertains to the sign, it would seem as if that power had been the dominant sound in the name of the object."

In order to give the reader some idea of the appearance of the cuneiform character,

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we subjoin the name of Darius (Dariyavas, Tariyavaus), written in the Persian, Scythic, and Assyrian alphabets:

Persian.



Scythic or New Susian.



Assyrian.



For fuller information on this subject, see Rawlinson, *The Persian Cuneiform Inscription at Behistun deciphered and translated*, etc. (Journal As. Soc., 1846, etc.); *Grotefend, Erläuterungen der Keilinschriften aus Behistun* (Göttingen, 1854); Lassen u. Westergaard, *Ueber die Keilinschriften der ersten und zweiten Gattung* (Bonn, 1845); Hincks, *On the First and Second Kinds of Persepolitan Writing* (Transact. Roy. Ir. Soc., 1846); Norris, *Memoir on the Scythic Version of the Behistun Inscription* (Journ. As. Soc., 1853); Rawlinson, *A Commentary on the Cuneiform Inscriptions of Babylon and Assyria* (1850); Oppert, *Études Assyriennes* (Journal Asiatique, Paris, 1857); Renan, *Critique*, etc. (Journ. d. Sav., Paris, 1859). See PALEOGRAPHY.

CUNEO. See CONI.

CUNNINGHAM, ALLAN, poet and *littérateur*, was b. in 1784, at Blackwood, in Dumfriesshire. The circumstances of his parents were humble. At the age of 11, C. was taken from school, and apprenticed to a stone-mason. He worked faithfully at his calling; but his spare time, and his evenings, were given to song and the collection of traditions. He first appeared in print as a contributor to Cromek's *Remains of Nithsdale and Galloway Song*. These contributions, purporting to be ancient ballads, were entirely the composition of the ingenious and ambitious stone-cutter. The publication gained him the acquaintance of Hogg and sir Walter Scott. With the latter, "honest Allan" was always a prodigious favorite. On his removal to London, he became one of the best known writers for the *London Magazine*. He subsequently obtained a situation in Chantrey's studio as foreman, or confidential manager, and this office he held till his death. During his career, he wielded an indefatigable pen. He wrote novels, poems, and a drama. His principal prose works, apart from his fictitious narratives, are *Lives of the Painters*, a *Life of Burns*, and a *Life of Sir David Wilkie*. He died in London on 21st Oct., 1842. As a Scotch poet, he ranks, perhaps, after James Hogg. His songs, although disfigured by false taste, mannerism, and a superabundance of ornament, have true lyrical impulse and movement.

CUNNINGHAM, PETER, son of Allan Cunningham, the poet (q.v.) (b. 1816, d. 1869), is known in literature as the author of *Handbook of London; Life of Drummond of Hawthornden; Life of Inigo Jones; Modern London*, etc.; as the editor of various English classics; and as a frequent contributor to periodicals.

CUNNINGHAM'IA, a genus of trees of the natural order *coniferæ*, nearly allied in botanical characters to the true pines and firs, but in foliage having considerable resemblance to the araucarias. *C. sinenois* is an evergreen tree, with narrow ovato-lanceolate, stiff, and sharp-pointed leaves, common in China, but too tender for the climate of northern countries.

CUP. A drink, compounded usually of soda-water, ice, wine, and flavoring extracts, is known by this name. *Champagne cup* requires one quart of champagne, one glass of brandy, two bottles of soda-water, one pound of crushed sugar, with borage or cucumber rind. *Cider cup* may be made in a similar manner. *Claret cup* is compounded from one quart of claret, a liquor glass of maraschino, one bottle of soda-water, half a pound of cracked ice, four tablespoonfuls of crushed sugar, a small quantity of grated nutmeg, and a sprig of green borage.

CUP, DIVINATION BY, a mode of foretelling events, practiced by the ancient Egyptians, and still prevailing in some of the rural districts of England and Scotland. One of the eastern methods consisted in throwing small pieces of gold or silver leaf into a C. of water, in which also were placed precious stones, with certain characters engraved upon them. The infernal powers were then invoked, and returned answer, either in an intelligible voice, or by signs, on the surface of the water, or by a representation in the C. of the person inquired about. By the modern method, a person's fortune is foretold by the disposition of the sediment in his tea-cup after pouring out the last of the liquid. Few people now, however, even among the most ignorant, have implicit faith in the oracle.

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CU'PAR-AN'GUS, a town on the borders of Perthshire and Forfarshire, and partly in both, is situated on the left bank of the Isla, a tributary of the Tay, 12¼ m. e. by n. from Perth, and 16 m. w.n.w. from Dundee. It lies between the Grampian and Sidlaw hills, in the center of the valley of Strathmore, and from its position in this valley it is popularly called "the capital o' the How." Pop. in 1891, less than 3000. It has extensive linen manufactures, with a considerable traffic in timber. Near the town are the remains of two Roman camps, on one of which stand the ruins of a monastery, built in 1164 by Malcolm IV., and destroyed at the reformation. Numerous richly carved tombstones were found in the graveyard contiguous to the parish church, evidently those that had marked the graves of the ancient dignitaries of the monastery. The abbey revenue in 1562 was £1234 14*s.* 9*d.* in money, and 182 chalders of victual. The classic hill of Dunsinane is situated about 5 m. to the s.w. of Cupar-Angus, and the dilapidated castle of the "bold Pitcur," who fell in the battle of Killiecrankie, in 1689, is within a distance of 2 miles.

CUPAR-FIFE, a royal, parliamentary, and municipal burgh, and the co. t. of Fifeshire, near the middle of the peninsula of Fife, on the Eden, 9 m. from its mouth, 32½ m. n. of Edinburgh, and 14½ s. of Dundee. It lies in a beautiful vale, stretching e. and w., with a range of hills on the s., and a fertile country, with wooded eminences, on the north. It consists chiefly of two streets at right angles to each other. Pop. '91, 4656. The chief manufactures are linens, bricks, and earthenware. It contributes, with St. Andrews, East and West Anstruther, Crail, Kilrenny, and Pittenweem, to return one member to parliament. A fortress of the Macduffs, thanes of Fife, once stood on a mound called the Castle hill, at the e. end of the town. In former times, religious shows, mysteries, or moralities, were acted on a green esplanade in front of the castle, still called the Play-field. There also was acted the *Three Estates*, a celebrated satire on the priesthood, which hastened the religious revolution, and was written by sir David Lindsay, whose estate of the Mount was near the town.

CU'PEL. See CUPELLATION.

CUPELLA'TION is the process of the separation of one metal from another (as lead from silver) by the use of a CUPEL highly heated in a muffle furnace. See ASSAY.

CUPID, one of the gods of the classic mythology, whose name in Latin signifies *desire*. The genealogy of this meddlesome divinity is rather confused. Sometimes he is represented as the son of Vulcan and Venus, or of Mars and Venus, while at other times the mythologists seem at a loss to name his father, and make him spring from the sea-foam, like Venus herself. As among the Greeks, the myth of Eros gave birth to numerous *erotes* or loves, so at Rome, also, that of C. originated a legion of cupids, who all possessed the same attributes as their prototype. Every one knows what these were: the bow, arrows, quiver, and wings. Often a bandage covered the eyes. The appearance was that of a chubby child, or youth with a malicious smile. His darts could pierce the fish at the bottom of the sea, the birds in the air, and the gods in Olympus. The immensity of space was his home, but, like his mother, he specially loved the flowery thickets of Cyprus.

CU'POLA (Ital., from the root of *cup*), a spherical vault, or concave ceiling, on the top of a building. Cupolas are hemispherical, or of any other curve, and often consist of glass, so as to form a window in the roof. See DOME.

CUPPING is the application of cups, from which the air has been exhausted, to the skin, with the object of causing congestion or excessive fullness of the cutaneous blood-vessels; and if it should be thought desirable to withdraw some blood, the skin may be cut or scarified, and the exhausted cups applied over the incisions, to favor its flow.

C. has been a part of surgical practice from the earliest times, and instruments for performing it have been found in use among the least civilized nations. Of old, the cups were either small horns, open at both ends, from which the air was withdrawn by suction at the narrow extremity, or glasses of various shapes, with a small hole in the bottom of each. This hole was plugged with wax, the air exhausted by heat, and when the operator wished to remove them, he withdrew the plug, and allowed the air to enter. The modern cups are of glass, with round or oval mouths, and closed bottoms. Some have small sockets for holding cotton wick in their interior.

The principal improvements have been in the methods of incising the skin. This used to be effected with a common lancet or narrow knife, with a short blade and convex edge, set in a long elastic handle, which the operator struck rapidly with his finger, so as to drive the blade 26 or 30 times into the skin.

This was so tedious an operation, that a number of similar blades were used at once. These are contained in a box, which has slits pierced in it corresponding to the number of blades; the latter can be caused to emerge at these slits by turning a handle, or more rapidly by setting free a spring, which causes them to revolve suddenly, and in doing so protrude at the slits more or less, according to the will of the operator. The operation is thus performed: The sacrificator, glasses, torch, spirits of wine, and a lighted candle are placed ready at hand; the part is sponged with hot water, so as to cause an increased flow of blood into it, then dried with a warm towel; the torch, previously saturated with the spirits of wine and lighted, is held for an instant in one of the glasses, which is now clap-

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ped on to the skin. The number of glasses depends on the quantity of blood it is thought desirable to abstract; each one will probably withdraw from three to five ounces. When the skin under the glass has become red and swollen, the cupper removes it, applies the sacrificator, and as rapidly as possible again exhausts the air from the glass, and claps it on again. The blood will now flow into it; and when enough has been taken, the glass is removed, and some lint applied to the wounds. This apparently simple proceeding requires considerable skill, so that C. is practiced as a separate profession in large towns, and the medical boards of the public services require that candidates for their appointments should produce a certificate of having received special instruction in the art. The difficulties consist in regulating the depth of the cuts, for should they be either too deep or too shallow, the blood will not flow. If the glasses be completely exhausted of air, their rims hurt the patient, and the blood will not flow, and it has happened that arteries or large veins have been wounded by ignorant operators.

There are many modifications of the ordinary C. apparatus, but all on the same principle.

Dry C. is simply applying the cups as described, but not wounding the skin. The ancients had a high opinion of this method, as they believed the "noxious humors" were drawn forth of the body into the cups; and it need scarcely be added that extempore cups may be found in tumblers, finger-glasses, or any air-tight vessel with a smooth rim.

CU'PULE, *Cupula,* in botany, a sort of cup formed by a number of cohering bracts, and surrounding the fruit or the base of the fruit in certain plants; as the oak, in which it is the cup of the acorn, and the hazel, in which it is the husk of the nut.

CUPULIF'ERÆ (i.e., cupule-bearing), or CORYLACEÆ, a natural order of exogenous plants, consisting of trees and shrubs, natives of temperate climates. The leaves are alternate and furnished with stipules. The male flowers, and sometimes also the female flowers, are disposed in catkins (and this order is regarded by many botanists as a sub-order of amentaceæ, q. v.); the stamens are 5 to 20, inserted into the base of scales or of a membranous perianth; the ovary is crowned by the rudiments of a persistent perianth, and surrounded by a cupule (q. v.) of various figure; there are several cells and ovules, but the greater part of the ovules are abortive; the fruit is a 1-celled nut, more or less inclosed in the cupule; the seed is usually solitary; the embryo large, with fleshy cotyledons and minute superior radicle.—This order contains many of the most important trees of Europe and America, including all the different kinds of oak, beech, chestnut, and hazel, the hornbeam, etc. Many species are also natives of tropical countries, but they are there only found at considerable elevations.

CUR (Welsh *cor,* a dwarf, anything small; *coravon,* a small river; *corgi,* a small dog), a name sometimes applied indiscriminately to small dogs of any kind not highly valued, and in this way often particularly appropriated to dogs of mongrel breed, but also used by naturalists as the common designation of many races, of which the terriers (q.v.) may be considered as the type; all of them of small size, and exhibiting in a high degree the capacity for domestication, along with activity and sagacity. These races are distributed over all parts of the world, and differ very considerably from each other, and are found domesticated even among very rude and savage tribes. The Pariah dog of India is reckoned among them, and exists in that country both in a wild and in a domesticated state; its body is more lank than that of the cur races of Europe, a character which is also in some measure exhibited by the dogs that haunt the streets of towns in Turkey, Persia, etc. The curs may, not improbably, have been the first domesticated dogs.

CURAÇA'O is the most important of the Dutch West India islands which lie near the northern coast of Venezuela, in the Caribbean sea. The colony includes, besides the island of C. with a pop. '94, of 27,769: Bonaire, 4341; Aruba, 8182; Netherlands part of St. Martin, 3608; St. Eustatius, 1714, and Saba, 2029. Entire pop. 47,643, all free. The capital of C. is Willemstad, a very handsome town situated on the bay of St. Anna. The soil of C. and its dependent islands is less productive than that of other tropical lands. The products are maize, beans, cattle, salt, phosphate of lime, red dye-wood, cotton, and fruits. Gold has to some extent been obtained by crushing. The stock consists of horses, asses, mules, cattle, sheep, goats, and swine. C. chiefly owes its prosperity to commerce with the neighboring islands and coasts. It is under the administration of a governor-general appointed by the government of the Netherlands. The island was discovered by Spain in 1527, taken by the Dutch in 1634, conquered by the English in 1807, and restored to Holland in 1815.

CURAÇOA is a well-known and esteemed liquor, made either from the small oranges called C. oranges, or from orange-peel, by digesting in sweetened spirits, along with a little cinnamon, and often a little mace or cloves. The spirits used are generally reduced to about 56 under proof, and contain about 3½ lbs. of sugar per gallon. C. is often colored by digesting in it for a week or ten days a little powdered Brazil wood, and mellowing the color by means of burned sugar.

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CURAÇOA ORANGES, small oranges which have fallen from the tree long before maturity. They have properties similar to those of orange-peel, but are more bitter and acrid, and are used for the same purposes.

CURARI, OURARI, WOORALI, or WOORARA, a celebrated poison used by some tribes of South American Indians for poisoning their arrows. It is by means of this poison that the small arrows shot from the blow-pipe (q.v.) become so deadly. The nature and source of this poison remained long unknown, the Indians being very unwilling to reveal the secret, which seems, however, to have been at last obtained from them by sir Robert Schomburgk, and it is now regarded as pretty certain that the principal ingredient is the juice of the *strychnos toxifera*, a tree or shrub of the same genus with that which yields nux vomica. See STRYCHNOS. It has a climbing stem, thickly covered with long spreading reddish hairs; rough, ovate, pointed leaves, and large, round fruit. The poison, when introduced into the blood, acts on the nervous system, and produces paralysis, with convulsive movements, and death ensues. It is supposed to be the most powerful sedative in nature. Artificial respiration is the most efficacious means of preventing its effects. It has been proposed to employ it in the cure of lockjaw and hydrophobia, and it has recently been asserted, as the result of experiment, that it can be very beneficially employed in the former disease. Like snake-poison, it is comparatively inert when taken into the stomach. See WOORALI.

CURAS'SOW, or Hoc'co (*Crax*), a genus of large gallinaceous birds of the family *cracidæ*, having a strong bill surrounded at the base with a skin—sometimes brightly colored—in which the nostrils are pierced, and the head adorned with a crest of feathers curled forward, which can be raised and depressed at pleasure. The species, which are not numerous, are natives of the forests of the warm parts of America. They congregrate in flocks, and although they live much among the branches of trees, their habits greatly resemble those of domestic poultry. They are very unsuspicious of danger, until taught by severe experience; and are easily domesticated. The best known species (*C. alector*) is about the size of a turkey; its plumage is almost entirely black. It is abundant in the forests of Guiana. Its flesh is very good eating. It is kept in poultry-yards in South America, and was introduced into Holland at the close of last century, where it seemed completely acclimated, but the stock was lost amidst the troubles which ensued on the French revolution. See illus., OSTRICH, ETC., vol. XI.

CU'RATE, literally, one who has the cure (Lat. *cura*, care) of souls, in which sense it is used in the church of England Prayer-book, "all bishops and curates." It is, however, generally used to denote the humblest degree in the church of England. A C., in this sense, is a minister employed by the incumbent of a church (rector or vicar), either as assistant to him in the same church, or else in a chapel of ease within the parish belonging to the mother church. He must be licensed and admitted by the bishop of the diocese, or by an ordinary having episcopal jurisdiction, who also usually appoints his salary. Any C. that has no fixed estate in his curacy, not being instituted and inducted, may be removed at pleasure by the bishop or incumbent. But there are *perpetual* curates as well as temporary, who are appointed where tithes are impropriate and no vicarage was ever endowed: these are not removable, and the impropriators are obliged to maintain them.

CURA'TOR TO A MINOR. See GUARDIAN.

CURB (in horses) consists of strain of the straight ligament which runs down the back of the hock; is most common in animals with straight small hocks and that conformation known as *sickle hams;* whilst like other strains it occurs from sudden and violent exertion, often proceeding in the lighter breeds from leaping or galloping in heavy ground, and in the heavier, from the effort of keeping back a load whilst going down a steep incline. Swelling appears on the inner and back part of the joint, generally causing lameness, which is most apparent in trotting, and, in slight cases, usually wears off after the animal has been out for ten minutes. Fomentations must first be used to allay the irritation and inflammation; when heat and tenderness disappear, cold applications will be advisable; when, after ten days, the enlargement still continues, a blister may be necessary; whilst, from the first, all work must be forbidden.

CURCAS. See PHYSIC NUT.

CURCU'LIO. See WEEVIL.

CUR'CUMA (Arab. *kurkum*), a genus of plants of the natural order *scitamineæ*, having the tube of the corolla gradually enlarged upwards, and the limb two-lipped, each lip three-parted. The species are stemless plants, with palmate tuberous roots, natives of the East Indies. The dried roots of some are the zedoary (q.v.) of the shops; the roots of others yield turmeric (q.v.); and some yield a kind of arrow-root (q.v.). The same species often yields both arrow-root and turmeric, the former being obtained from the young roots, the latter from the old.—*C. amada* is called MANGO GINGER. Its root when fresh has the smell of a mango, and in its qualities resembles ginger. It is a native of Bengal.

CURÉ, originally meant any clergyman; it is now restricted to the assistant of the spiritual rector or vicar.

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CU'RES, a t. of the Sabines, about 25 m. from Rome, on the Tiber, the birthplace of Tatius. The term *Quirites*, as applied to the Roman people, is supposed to have come from Cures. The town was destroyed by the Lombards near the close of the 6th century.

CURFEW (Fr. *couvre-feu*, cover fire). To William the Conqueror is ascribed the introduction of the C. bell into England, the object of which was to warn the people to cover up their fires, and retire to rest. The time for ringing these bells was sunset in summer, and about 8 o'clock in winter; and certain penalties were imposed upon those who did not attend to the signal. The practice of ringing the C. bell, however, appears to have prevailed throughout Europe long before the era of the Norman conquest, its object being the laudable one of preventing fires, which, owing to houses being chiefly composed of wood, were then both frequent and destructive. The custom of ringing the C. bell at 8 or 9 o'clock is still continued in many parts of England, though its original significance is of course lost.

CU'RIA, in Roman history, the name of a division of a tribe in the constitution of Romulus. The tribes being 3 and the divisions 10, there were 30 curiæ. This division was a division of the populus to the exclusion of the plebs; and the assembly of the populus was called the *comitia curiata*. See COMITIA.

CU'RIA MU'RIA ISLANDS. See KOORIA MOORIA ISLANDS.

CURIO. This expression is now used in a much more extended sense than heretofore, when it was simply considered as an abbreviation of the word curiosity. At present it may signify any rare or curious articles or pieces of workmanship; bibelots or "things" in general worthy of preservation, on account of their antiquity, rarity, or peculiarity in any way. The articles most generally found in the collection of the curio-hunter may be classified under the various heads of pottery, porcelain, enamels, metal work, arms, clocks, watches, fans, musical instruments, and old manuscripts. Commencing with pottery, which has, perhaps, excited more enthusiasm than any other class of curios, the urns, drinking-cups, food-vessels, etc., found among the remains of the pre-historic races, of course are chiefly valuable for their antiquity. These specimens have been taken from the mounds in Great Britain, France, Scandinavia, Italy, Greece, and neighboring islands. They are mostly to be found in the British and other museums, many fine specimens from the island of Cyprus having found their way to the Metropolitan Museum in New York city. Very little early Egyptian work remains, but the most interesting are the Canopic vases found in the tombs, which have a lid in the form of a human head. The shapes and ornamentation of the archaic pottery of Babylon and Nineveh are strikingly odd; and specimens are much in request, for their beautiful coloring, being made of red, blue, gold, and green paste. About 827 B.C. in Sicily there arose a kind of metallic iridescence, due to the partial reduction of the oxides of metals used as colors, during their passage through the muffle. Some very fine specimens of this ware remain intact. For examples of a later date the curio-hunter may seek for Damascus and Persian and Chinese pottery, and the styles and decorations become more beautiful and more elaborate. The majolica has been a great favorite with collectors, and its manufacture arose about the twelfth century, although it was produced in the greatest profusion during the sixteenth century. Many plaques and plates decorated with figures and coats of arms may be found in the museums to-day. From the sixteenth to the eighteenth centuries some of the finest pottery was made in France, and the names of Palissy and Oiron ware became famous. Very few specimens of the latter kind remain, as it was manufactured specially for Henry II., and these are in the Louvre and the Rothschild family. In England, John Wedgwood founded the famous factory known by his name, but, at present, only one example, signed by him is known to exist, and that is in the Jermyn Street Museum of Geology, London. It is a "puzzle-jug" with a hollow handle and three spouts, made of a coarse brown clay covered with green glaze. The potter's name and date, 1691, are incised around the jug. The exquisite Sèvres and Dresden porcelains are always objects of value to the collectors of curios, as are also some of the rare specimens of Chinese workmanship, which find their way into other countries. Perhaps the most noted example ever brought into the United States, was that known as "The Peachblow Vase," which was only about ten or twelve inches in height, of an ordinary shape, and a delicate terra-cotta in color, but exquisitely shaded and blended, and over all a transparent glaze. Its value was placed at $15,000. A collection of fine laces is highly-prized, beginning with those which were manufactured in the sixteenth century, previous to which date what might have been called lace was simply twisted threads, in loops along the edge of garments. Fans have always been viewed with great interest by collectors, either from their value or associations, as they were much used by the ancients and played an important part in the ceremonies of Oriental nations. Great artists have condescended to paint them, like Boucher and Watteau and Isabey, which adds to their value. In the latter part of the eighteenth century a fan marked "Vernis par Martin" was more esteemed for the varnish upon it than the painting, as it added so much to the delicacy, and preserved the work. TAPESTRIES (q.v.) form an attractive,

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if also an expensive article for the collector. These were manufactured in England in the fourteenth century, but more largely in Flanders, where were produced the most perfect models of textile art, rich in coloring and graceful in design. In 1603 the Gobelin factory was established, and at present many beautiful specimens are brought from there. Most of the earliest work which was called tapestry was really embroidery, for instance, the famous Bayeux tapestry, which represents scenes in the fortunes of William the Conqueror and his followers. It is said to have been the work of Queen Matilda and her maidens. Bric-à-brac, derived from *de bric et de broc*, meaning "from hither and thither," expresses to the collector odds and ends of all sorts, and may include mosaics, tankards, snuff-boxes, buckles (knee and shoe), pipes, bracelets, jewelry, rare and antique, aigrettes, crowns, head-dresses, and various articles valued from religious associations, like the ciborium, a vase in which the sacred wafers are kept in the Roman Catholic church, and the quincunx, a religious image or reliquary in the shape of a cross. Articles carved from jade or stone so hard that it can only be cut with a diamond and held sacred by the Chinese, are very highly valued. It varies in color from a creamy white to a very dark green. In the rooms of the New York Historical Society may be seen some wonderful Egyptian antiquities many of them over 4000 years old. Among them may be mentioned the gold necklace and ear-rings of Menes, the first Pharaoh of Egypt, dated 2771 years before Christ; the large gold signet ring of Shoufou, or Cheops, as high-priest and king who built the great Pyramid 2352 B.C.; burned and unburned bricks made without straw by the children of Israel in Egypt and dating from Thothmes III.; a teetotum in stone, with the Greek alphabet inscribed thereon, supposed to have been used by children to learn their letters (it is somewhat like a modern doll with feet covered, showing a head and stumps of arms); the iron helmet and breastplate of scale armor of Shishak (971 B.C.), who took Jerusalem from Rehoboam. In the Astor Library, New York city, may be found many interesting books and old manuscripts, like the *Bull of Pope Leo X. against Martin Luther* (q.v.), printed in Rome in 1520; a manuscript copy of the Koran (q.v.), in Arabic, written on vellum about 650 A.D., and Zahn's magnificent frescoes of Pompeii, with 300 brilliantly illuminated pictures reproducing in all their freshness and beauty the decorations that still exist in fragments of the walls and palaces of that fated city, after having been buried beneath the lava and scoriæ of Vesuvius for so many centuries. At the Museum of Natural History may be seen many curios and fossils illustrating the geological formations of the United States and implements belonging to the aborigines. Shell pins and ornaments, wooden combs and stone knives, and a Winnebago song-stick from which the Indians extracted music. Historic clocks and watches, and furniture which has been used by famous men, may also be mentioned as among the bibelots desired by those who treasure curiosities.

CU'RISCHES HAFF. See KURISCHES HAFF.

CUR'LEW, *Numenius*, a genus of birds of the order *grallatores*, and of the same family (*scolopacidæ*) with the snipe, woodcock, avocet, stilt, godwit, etc. The bill is long, slender, curved, and compressed; the face and head are feathered; the legs are slender, and part of the *tibia* is naked as well as the shank; the tail is short, and the folded wings extend about as far as the tail. The common C. (*N. arquata*), the *whaup* of the Scotch, is a bird of wide geographic distribution, being found in tropical, temperate, and arctic regions of the old world and in Australia. It is common in Britain, frequenting the sea-shores in winter, and elevated moors in summer. Its peculiar cry or whistle is among the well-known characteristics of many upland scenes. It feeds on worms, mollusks, and insects. Its long bill enables it to seek its food in marshy or boggy ground. It builds a slight nest of leaves or other dry materials, in some tuft of rushes or among long grass or heath, in which four eggs are laid. The C. is good eating.—The WHIMBREL (*N. phæopus*) is a smaller species of C., much resembling the common curlew. It is also very widely distributed in the old world; it frequently occurs on the shores of Britain, but seems to breed only in the most northerly moors. North America has several species of C., some of which extend their summer migrations to very northerly regions. The ESQUIMAUX C. (*N. borealis*) is sometimes seen migrating in dense flocks.

CURLING, a sport on the ice common in Scotland, where it is played by all classes of people in winter. Frozen-over lakes and rivers answer for the purpose, but under the auspices of C. clubs, artificial shallow ponds are maintained for the sake of this popular national sport, and these *bonspiels*, or set matches, are contested with immense spirit. The sport is regulated by a body of rules issued by a central association called the Caledonian Curling club, which has grand matches in which hundreds are engaged at least once, if possible, every winter. The remarkable and pleasing peculiarity of C. is, that it produces for the time a thorough mingling of ranks—peers, peasants, clergymen, farmers, country gentlemen, and tradesmen, all mingling hilariously and familiarly for the occasion. The sport belongs more particularly to the south-western division of Scotland. Latterly, it has migrated to England, Canada, and other countries where Scotsmen can find ice of sufficient strength and keenness. C. is played with flattish round stones, about 9 in. in diameter, prepared by stone-hewers, each stone weighing from 30 to 45 lbs. Each of the players has a pair. The stones are provided with handles, to

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enable the player to hurl them on the ice with the proper degree of force. As at bowls, the stones are hurled to an assigned point or mark. The game is as follows: Sides are made up, usually consisting of four against four, with a director styled *skip* for each; after which a certain length of ice, of from 30 to 40 yards in length, and 8 or 9 ft. across, is chosen. This is called the *rink*. Certain marks are then made at each end of the rink, consisting of several concentric rings, called *broughs*, and a center, called the *tee*. A certain number is game, usually 31, and the keenness displayed by rival sides in competing for victory, is perhaps without a parallel in any other pastime whatever. One on each side plays alternately. The chief object of the player is to hurl his stone along the ice, towards the tee, with proper strength and precision; and on the skill displayed by the players in placing their own stones in favorable positions, or in driving rival stones out of favorable positions, depends nearly all the interest of the game. At a certain distance from each of the tees, a score—the *hog-score*—is drawn across the ice; and any stone not driven beyond this mark, counts nothing, and is laid aside. In country places, a dinner composed of "beef and greens," the well known curler's fare, generally concludes the day's diversion, which, taking place when out-door labor is suspended, is felt to be no encroachment on rural occupations. For laws and regulations of C., and general remarks on the game, see *Curling*, by Dr. James Taylor, 1884.

CUR'RACH, COURACH or COR'ACLE (Celt. *corwg, curach;* Lat. *curuca, carrocium, carabus*), the name given in the British islands to a canoe or boat, made of a slender frame of wood, covered with skins. Skiffs of this sort, as well as canoes hollowed out of the trunks of oaks, were in use among the Britons in the earliest times of which we have record. Julius Cæsar, who built some of them after the British model, tells us that the keel and gunwales were of light wood, and the sides of wicker, covered with hides. Similar descriptions of the C. are given by Pliny, Lucan, Solinus, Festus Avienus, Sidonius Apollinaris, and others. The first occurrence of the name seems to be in Gildas, who wrote in the 6th c.; he speaks of the C. as in use among the Scots and the Picts. A long voyage in the North sea, made in a C. during the same century, by one of the companions of St. Columba, is commemorated by Adamnan, who died in 704. In 878, three Irish missionaries sailed in a C. from Ireland to Cornwall; the voyage occupied seven days; and the size of the C. is indicated by the remark that it was one of two skins and a half. An old life of St. Patrick speaks of a C. "of one skin, with neither helm nor oar." The C. of a larger size had a mast and sail. The C. still continues to be used on the Severn, and on many parts of the Irish coast, especially on the shores of Clare and Donegal. The last C. known to have been used in Scotland is in the museum at Elgin. It was employed on the Spey, towards the end of last century.

CURRAGH, in Kildare co., Ireland, an open country long favored as a race-course, and place of meeting for the people. A camp was established there during the Crimean war capable of accommodating 10,000 men.

CUR'RAN, JOHN PHILPOT, a celebrated legal and parliamentary orator, b. at Newmarket in the county of Cork, Ireland, July 24, 1750; was educated at Trinity college, Dublin; and in 1773, having resolved to adopt the law as a profession, went to London and entered himself at the Middle Temple. Two years after, he was called to the Irish bar, where his humorous, flowery, and sarcastic speech secured him immediate success, which his attractive social qualities did much to extend. In 1782, he obtained a seat in the Irish parliament as member for Kilbeggan, his general policy being in unison with that of Mr. Grattan and the few other liberal members who were then in the house. In debate, C. was usually charged with the reply to opponents, for which important duty his ready speech and cutting retort admirably qualified him. But his sarcasm led him into several duels, in which fortunately little harm was done on either side. In 1788, he was in favor of the formation of Irish volunteers; and in subsequent years, he was constant and eloquent in his appeals to government to adopt a different policy towards Ireland, as that which it was pursuing was likely to drive the people to rebellion. Government gave no heed, and the rebellion of 1798 was the consequence. C. had retired from parliament before the Union, of which he was a warm opponent. He was appointed master of the rolls in Ireland in 1806, an office he held until 1813, when he resigned. He died in London, Oct. 14, 1817. C. is best remembered for his wit and gayety, of which many excellent examples are preserved in the various memoirs, recollections, etc., of him which have been published.

CURRANT, a name originally belonging to a small kind of grape (see CURRANTS), and transferred, in consequence of the similar size of the fruit, to many species of the genus *ribes*, the most important and almost the only genus of the natural order *grossulariaceæ*. The species known as *currants* are destitute of spines, and have the flowers in racemes: the spiny species are known by the name Gooseberry (q.v.). Among the fruit shrubs most generally cultivated in our gardens is the RED C. (*R. rubrum*), *groseille* of the French, a native of woods and thickets in the s. of Europe, found also in some parts of Asia and of North America, perhaps rather a naturalized than a truly native plant in Britain. It has long been cultivated, although it does not appear that it had a place in the gardens of the ancient Greeks or Romans. The berries, besides being used for dessert, and to a much greater extent for pies, and for making jelly, are used also for making an agreeable and refreshing beverage, called in France *eau de groseilles* (made of the juice of the fruit, water and sugar, strained, and iced), and a well-known

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fermented liquor called *currant wine* (q.v.). The WHITE C. is a mere variety of the red, the result of cultivation, with fruit less acid, and more fit for dessert, generally also rather larger. There are many sub-varieties, and many intermediate shades of color. Both the red and the white currants are either trained or standard bushes, or against walls, the latter treatment producing larger and finer fruit, and both are sometimes trained on a n. wall, to retard their ripening till after the ordinary season. They grow readily, like the shrubs of this genus in general, from cuttings. The BLACK C. (*R. nigrum*), *cassis* of the French, grows in moist woods, and on the banks of streams in Europe and the n. of Asia. The fruit is much larger than the red C., and cultivation has lately produced varieties remarkable for size. There is a variety found in Russia with yellow berries. The black C. is not so much cultivated in Germany and Holland as the red, and is comparatively neglected even in England, but is to be found in almost every garden in Scotland. The jelly and preserve made from it are very useful for sore throats, as is also *black C. vinegar*, made in the same manner as raspberry vinegar. In Russia, the berries are gathered in large quantities in the woods, and dried in ovens, to be used in pies. They are tonic, and also slightly diuretic and sudorific. A liqueur, called *liqueur de cassis*, is prepared in France from the black C., the manufacture of which has recently acquired a great importance in the Côte d'Or and neighboring departments. The town of Dijon contains more than 80 manufactories, and produced recently, in one year, not less than 220,000 gallons, the wholesale price of which—of the best quality—was equal to seventy cts. per quart. Large tracts of land are planted with the black C. to supply the liqueur manufactories. It has very reasonably been suggested that the experiment of the introduction of this manufacture should be made in Scotland, and even in the Hebrides and Shetland islands, where the black C. perhaps grows as luxuriantly, and bears fruit as abundantly as in any part of the world. Many other species of C., producing berries somewhat similar to those of the species so extensively cultivated, and some of them probably deserving of attention and cultivation, are found in temperate and cold climates in almost all parts of the world. One with beautiful red berries, larger than the largest English red C., occurs on the Himalaya, at an elevation of 13,000 feet. The RED-FLOWERED C. (*R. sanguineum*), now so common as an ornamental bush in shrubberies, and trained on walls, producing in April a profusion of deep-red flowers in large drooping racemes, is a native of the n.w. of America, and was introduced into Britain in 1826. Its bluish-black, mucilaginous, insipid berries are not, as is popularly believed, poisonous. The GOLDEN C. (*R. aureum*), also a very ornamental shrub, from the same regions, has a tubular calyx and long golden yellow flowers. Its fruit, which is either yellow or black, and of fine flavor, is not freely produced in Britain. The name NATIVE C., or AUSTRALIAN C., is given in Australia to the berries of different shrubs, particularly the white berries of *leucopogon Richei*, of the natural order *epacridaceæ* (q.v.). The French naturalist Riche, who was attached to D'Entrecasteaux's expedition, mainly supported himself on these berries for three days, when he had been lost by his companions. Other fruits bearing the same name are produced by species of *coprosma* (nat. ord. *cinchonaceæ*), but they are very inferior.

CURRANTS, a small kind of raisin (*passulæ minores*), are the dried red or blue berries of a small-fruited seedless variety of the common vine, which is cultivated in the east, and especially in Greece. The name is derived from the city of Corinth, in the neighborhood of which they were first cultivated. They are very small, round, with a thin skin, without seeds, and very sweet. Those brought from the island of Zante are most esteemed. They are much used by bakers and cooks, entering into the composition of many kinds of cakes, puddings, etc. They are a principal article of export from Greece, and the failure of the crop is severely felt in that country; whilst an increase of the price of C. is regarded as a disagreeable occurrence by the housewives of America. C. are simply dried in the sun, on the ground, and then packed into barrels. In a few districts of Greece, a very sweet oily wine, called currant wine, is made from currants.

CURRANT WINE is made of the juice of red or white currants, to which is added about one pint of water for every four pints of berries employed. About a pound and a half of sugar is afterwards added to each pint of the liquor, a little spirits being generally also added, before it is set aside to ferment. A larger quantity of sugar is sometimes employed, and no water, and a stronger and sweeter C. W. is thus produced. Fermentation requires several weeks, and the wine is not fit for use for at least some months afterwards. Black C. W. is made in the same way from black currants, but the fruit is put on the fire in as small a quantity of water as possible, and heated to the boiling-point before it is bruised. C. W., well made, may fairly challenge comparison with many products of the grape.

CURRENCY means originally the capacity of being current, or, as Johnson defines it, "the power of passing from hand to hand." It is applied in practice to the thing that is so current, and generally to whatever, by being current among any nation or class of persons, serves as the money with which they buy commodities or pay their debts. It is necessary to be content with a practical explanation, without venturing on a scientific definition of the term, because, among the many disputed points in political economy, there is none productive of more exciting controversy than the proper regulation of the C.; and as the advocate of each theory is apt to define the term in the

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manner best suited to serve his own ultimate conclusions, his adversaries generally deny that his definition is sound. Whether correctly or not, it is applied in practice to everything that is received for payment. It differs from the word money, in its general acceptation, in as far as it expresses only that which passes as money at some time or place referred to. The leading question among political economists regarding C. is, how far it should be restrained. The most effectual method of restraining it is by confining it to the precious metals. If it were law that none but a gold C. should be used in any country, and if, at the same time, there were no effort to tamper with this gold C., and give it an artificial value, the C. of that country would keep its value all the world over, because it has been paid for in commodities, and will be sold again whenever it is in excess of the needs of those who use it. But for this very reason it is a very expensive C., and therefore, ever since man's ingenuity was turned to trade, methods have been devised for superseding gold or the other precious metals by something cheaper. Unless, however, law or custom intervenes to give it efficiency, this cheaper material will only be worth its own intrinsic value. A five-pound bank of England note is worth so little in its intrinsic value as a picture upon thin paper, that such a value can hardly be expressed. It derives its power as C. from the obligation it fixes on a great rich corporation to make good its professed amount to the holder. We thus pass from a purely bullion C. to the next step of restraint, which is generally called a mixed currency. Here some maintain that no note should be issued unless the banker or other person issuing it has in his possession as much bullion as will pay it. Others say it is sufficient that he is bound to pay its amount in bullion on demand without his actually possessing the bullion throughout the whole period of the C. of the note. A third party, again, are for a C. entirely free of a metallic basis; they hold that naturally paper-money, passing from hand to hand, will represent transactions, and will therefore come in the end to be made good in some shape or other; and they further hold, that if some losses should thus occur, these will be more than compensated by the rapid increase of trade and enterprise, caused by a free trade in C., as it is termed—that is to say, by every man issuing his own notes or promises to pay to whoever will take them. This last and extreme class of "currency doctors," as they have been termed, have lately been losing influence, and disappearing from the contest. Through a succession of practical measures, reached with considerable caution, the English have come to a mixed C., resting on a compromise between the two classes of mixed C. above referred to. In the theory of the measures brought to completion under sir Robert Peel in 1844, it is admitted that, to a certain extent, a C. can be based on transactions and the property of those concerned in them, but that a limit must be drawn, to prevent the power of creating such a C. from running to excess, by the issue of notes which cannot be immediately made good by those who issue them. Accordingly, the several banks in existence were allowed to continue their note circulation, but they were permitted to increase it only on the condition of having bullion in their coffers to pay the additional notes issued by them. A C. which is not bullion, and is not worth its nominal value in bullion, is called a "depreciated currency." Before the resumption of cash payments, the notes of the bank of England had sunk to be worth but 16*s.* in the pound, as compared with gold. A depreciated C. may be created by a government calling notes or any other form of money a legal standard, and issuing a greater quantity of them than the real transactions of the country and the property passing from hand to hand require; or it may be created by private persons acting under laws by which the right of issuing a C. is not duly limited. This faculty which a C. has of being depreciated without being repudiated, is the real source of danger in all proposals for an unfettered C., or a free trade in the issue of money. If the bank-notes for which bullion cannot be immediately obtained were repudiated, there might be a natural check on over-issues; but it is their nature, on account of the difficulty of getting bullion for them, or the chance that it may never be got, that they pass at a discount or reduction of their value. Hence such a C. would be ever shifting; there would be no permanent standard, and the person incurring a debt before a depreciation which he pays afterwards would, in reality, be paying his creditor a dividend only. A depreciated C., however, is useful for small transactions. In the silver C. of Gt. Britain, a pound is worth little more than four fifths of a sovereign. If a person due £100 could pay it in silver, he would get off with a dividend of from 16*s.* to 18*s.* in the pound; but by law, silver is not a legal tender for more than 40*s.* The copper C. is so far below its real value, that it has not been thought worth while to give it a permanent weight—the pence and halfpence now issued are little more than half the weight of those of former mintages; but they are only used as a medium for small sums, and the royal stamp is sufficient to establish a reliance on them. It is evident, of course, that any nation may create a currency at will, decree its nominal value, and enforce its acceptance among their subjects; though its real value will be subject to laws deeper and stronger than any statute. By common consent gold (and silver, to some extent) is currency among nations. On extraordinary occasions currency has been issued in notes under the form of a loan to the government, to an enormous extent, as during the civil war in America, when the obligations of the United States sold for only about 32 cents on the dollar. But all these notes, though so distrusted at the time, were really good for all that they promised, and are now recognized as such. See MONEY, UNITED STATES.

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CURRENT RIVER, a stream in Arkansas, length about 250 miles. It runs through a hilly region rich in minerals, though not much developed. It abounds in fish.

CURRENTS. See GULF STREAM; TIDES.

CURRICULUM (Lat., "a course"), often applied to a fixed course of study, as prescribed by a school, college, or university. In this sense a college may include, in addition to the curriculum of arts, that of medicine, or law, or science, or theology. By curriculum is frequently meant also the entire range of studies open to the students.

CURRITUCK, a co. in n.e. North Carolina, facing the Atlantic ocean; 217 sq. m.; pop. '90, 6747. The soil is sandy and poor. Co. seat, Currituck.

CURRY, a co. in s.w. Oregon, on the Pacific ocean; intersected by Rogue river; 1590 sq. m.; pop. '90, 1709. Has a rough surface, but fertile soil. Co. seat, Gold Beach.

CURRY, JABEZ LAMAR MONROE, D.D., LL.D., b. Lincoln co., Ga., 1825; removed to Ala., 1838; was admitted to the bar, 1845, and became a lawyer of mark; was in the Ala. legislature, 1847–55, and in congress, 1857–61. He then became a member of the confederate congress. After the war he became a Baptist minister; was president of Howard college, Ala., 1868–68; professor of law, Richmond college, 1868–81; general agent of the Peabody educational fund, 1881–85; U. S. minister to Spain, 1885–88; and subsequently chairman of the educational committee of the John F. Slater fund. His publications include *Constitutional Government in Spain; William Ewart Gladstone* (1891); *The Southern States of the American Union* (1894), etc.

CURRY-COMB. A kind of scraper used for dressing horses. It consists of a number of iron plates notched on one edge to form rough teeth. These plates are fastened in parallel lines to an iron back, to which a handle is attached, and the horse is "curried" by scrubbing with the teeth.

CURRYING. See LEATHER.

CURRY POWDER, or CURRY PASTE, is a compound of turmeric and various spices; it is used to a large extent in India and elsewhere as a seasoning for a variety of dishes. One of the best receipts for the compounding of C. P. is, turmeric powder, 6 oz.; coriander seed powder, 8 oz.; black pepper, 4 oz.; fenugreek, 2 oz.; ginger, 2 oz.; cayenne pepper, ½ oz.; cummin seed, ½ oz. Another process is to mix turmeric powder, 5 oz.; coriander seed powder, 3 oz.; black pepper, 1 oz.; ginger, 1 oz.; cayenne pepper, 1 oz.; scorched mustard, 2 oz.; mace, 2 drams. And a third variety is obtained from turmeric powder, 8 oz.; coriander seed powder, 4 oz.; black pepper, 1 oz.; cayenne pepper, 1 oz.; scorched mustard, ½ oz.; mace, 1 dram; cinnamon, 1 dram; cardamoms, 2 drams.

CURSE OF SCOTLAND, a term applied to the *nine of diamonds* in a pack of playing cards. Much uncertainty prevails respecting the origin of this phrase. The most probable explanation is, that it refers to the detestation entertained in Scotland towards John Dalrymple, first earl of Stair, on account of his concern in the massacre of Glencoe, and for which he had to resign office, 1695. The heraldic bearing of this personage was "or, on a saltire azure, nine lozenges of the field." These nine lozenges resemble the nine of diamonds, and hence the popular phrase, the curse of Scotland.

CURSING. See INCANTATION, SWEARING.

CURSIVE WRITING. See PALÆOGRAPHY.

CURSO'RES, an order of swift-footed, large, and strong birds, of which the ostrich, emeu, and cassowary are examples. Among fossil C. are the æpyornis and dinornis.

CURTAIN, in fortification, is the portion of rampart or wall between two bastions or two gates. In a regular siege, to batter down the C. is one of the main operations depended on; and many of the external works constructed by the defenders are intended to frustrate, or at least embarrass, this operation.

CURTAL FRIAR, a term used by Sir Walter Scott, in *Ivanhoe*, as equivalent to irregular clerk or hedge-priest, and applied by him to Friar Tuck, of Copmanhurst. The phrase seems to denote a monk with his gown or frock shortened for convenience of moving about. See *Ivanhoe*, chap. XXXII., and *Robin Hood and the Curtall Friar*, in Child's *Ballads*, v. 273.

CURTIN, ANDREW GREGG, b. Penn., 1817; studied law in Dickinson college; admitted to the bar, 1839; presidential elector, 1848; candidate for elector on whig ticket, 1852; appointed secretary of state (Penn.), 1854; republican gov., 1861–66; was noted for patriotism; minister to Russia, 1869–72; joined the democrats, and represented them in congress, 1881–87. He died Oct. 7, 1894.

CURTIS, BENJAMIN ROBBINS, LL.D., b. Mass., 1809–74; graduated at Harvard. He was a member of the bar in Boston, and in 1851 was appointed one of the justices of the U. S. supreme court, resigning this office in 1857. On the impeachment of Andrew Johnson, he appeared as one of the counsel for the defendant. His reports of law cases are well known. See *Memoirs and Writings* (Boston, 1880).

CURTIS, GEORGE TICKNOR, b. Mass., 1812; graduated at Harvard, and began law practice in Boston, afterwards removing to New York. He has been several times in the Massachusetts legislature, and was for a time U. S. commissioner. While acting as such he returned to his master the fugitive slave Thomas Sims, an act which brought upon him severe censure. Among many books issued by him are *Rights and Duties of*

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Merchant Seamen; Treatise on the Law of Copyright; History of the Origin, Formation, and Adoption of the Constitution of the United States; and various works on legal subjects. He died March 28, 1894.

CURTIS, GEORGE WILLIAM, LL.D., b. Providence, R. I., 1824. In early life he was clerk with a merchant of New York. In 1842, he and a brother joined the Brook Farm association, near Roxbury, Mass., and from there both went out as farmers. In 1846, he visited the old world, and on returning published *Nile Notes of a Howadji*, comprising his observations in Egypt. Two years later came *The Howadji in Syria*. About this period he undertook the editorship of a new monthly magazine (Putnam's), and was a frequent contributor to the *New York Tribune*. After the suspension of the magazine (in which Curtis was a heavy loser), he lectured and wrote for the Harpers, particularly "The Editor's Easy Chair" in the *New Monthly Magazine*, a series of papers regularly continued to the date of his death. He was for a long period the principal editor of *Harper's Weekly*, a very widely circulated illustrated journal. Among his separate works not already mentioned are *Lotus Eating; Prue and I; Trumps;* and the *Potiphar Papers*. In 1890 he became chancellor of the university of New York. He was popular as a lecturer and eminent as a political orator, and was master of a finished literary style. He d. 1892.

CURTIS, SAMUEL RYAN, b. N. Y., 1807–66; a graduate of West Point; served in the Mexican war as col. of volunteers; was a member of congress from 1855 to 1861. In the war of the secession, he served in various grades, reaching maj.gen. of volunteers. In 1865, he was commissioner to arrange treaties with certain Indian tribes. He was greatly interested in the construction of the Union Pacific railroad.

CURTIUS, ERNST, a distinguished German philologist and antiquary, b. Sept. 2, 1814, at Lübeck. After a good preliminary education at the high school of that place, he attended several German universities (Bonn, Göttingen, and Berlin) as a student of philology. In further pursuance of the path he had chosen—viz., the investigation of Greek antiquity—he went (1837), in company with prof. Brandis, to Athens, where he stayed several years. When his teacher, O. Müller (q.v.), came to Athens, C. accompanied him in his travels through Greece. On the death of Müller at Athens, in 1840, C. returned to Germany, visiting many places in Italy by the way. He graduated in Halle and after he had taught for some time at two Berlin gymnasiums, he was made a professor extraordinary at the university of that place. His *Anecdota Delphica Inscriptiones Atticæ Duodecim*, and *The Akropolis of Athens*, were published about this time. In 1844 he was called to the honorable position of tutor to the present crown-prince of Prussia. Six years later he returned to his academical office; in 1856 he was called to Göttingen; and in 1863 he was made ordinary professor at Berlin, and permanent secretary of the academy of sciences. In 1874 he was sent by the German government to negotiate a treaty with the Greeks, to permit its undertaking those important excavations at Olympia begun in 1875. His principal works are *Peloponnesos* (1852), a description of the country of Greece, with reference to its traditions, history, and monuments; *Attic Studies* (1864); and a *History of Greece* (Eng. tr. 1868–76). He d. in 1896.

CURTIUS, GEORG, a distinguished classical scholar, the brother of the former, who has acquired a high reputation for the light he has thrown on the Greek and Latin languages, by applying to them the comparative method. Born April 16, 1820, at Lübeck, he studied at Berlin and Bonn. After a short activity at Berlin, and a longer stay at Prague and Kiel universities, he accepted (1862) the professorship of classical philology at Leipzig. Of his published works are to be noted, *De Nominum Græcorum Formatione* (Berl. 1842); *Die Sprachvergleichung in ihrem Verhältniss zur Classischen Philologie* (Dresd. 1845); *Sprachvergleichende Beiträge zur Gr. und Lat. Gram.* (Berl. 1846); *De Nomine Homeri* (Kiel, 1855). His *Griech. Schulgrammatik* (11th ed. 1875) is in high repute, and his *Grundzüge der Griech. Etymologie* (Leipzig, 1862) is a most valuable contribution to that department of philology; also *Das Verbum der Griechischen Sprache* (1879). He d. 1885.

CURTIUS, MARCUS or METIUS, a noble Roman youth who (according to tradition) heroically sacrificed his life for the welfare of his country, 362 B.C. A chasm, it is said, had opened in the forum, and the soothsayers predicted that some great calamity would happen if there were not thrown into it the best wealth of the state. While it was proposed to consult the oracles, and determine what this best wealth could be, C. appeared on horseback and in full armor, and exclaimed: "Rome has no greater riches than courage and arms." He then rode into the chasm, which immediately closed over him.

CURTIUS RUFUS, QUINTUS, a Roman historian, author of the work *De Rebus Gestis Alexandri Magni*, in ten books, of which the first two have been lost, and the text of the remainder has come down to us in a damaged condition. Great differences of opinion have existed with regard to the time in which C. wrote, for his name is first mentioned by writers after the 12th century. Some critics have supposed that C. lived in the reign of Augustus; others that he wrote in the 2d c., or under Constantine or Theodosius; while some regard the work ascribed to C. as a composition of the 13th century. The most probable opinion is that he flourished in the time of Vespasian. The value of the work is as dubious as its authorship. C. had a very inaccurate knowledge of geography, chronology, military tactics, astronomy, and historic criticism; hence his work is far

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from being reliable as a whole. The style, though declamatory, is on the whole pure and elegant. The first edition of C.'s history was published at Venice about 1471. Among modern editions may be mentioned Mützell's (Berlin, 1841) and Zumpt's (Brunswick 1849); Vogel (1875–80).

CURUKU OIL, or BRAHMADUN'DU OIL, a pale yellow, limpid oil, obtained in large quantities in India from the seeds of the *argemone* (q.v.) *Mexicana* or prickly poppy, a plant accidentally introduced, but which now flourishes luxuriantly in all parts of India. It is used for lamps, and for other purposes, but possesses properties which render it unfit for food.

CU'RULE CHAIR, the chair of state, equivalent to a throne, among the early Romans. None except consuls, prætors, and a few others high in authority was permitted to occupy it. The chair was usually ornamented with gold and other precious work.

CURVATURE. The C. of a plane curve at a point is its tendency to depart from a tangent to the curve at that point. In the circle, this tendency is the same throughout, for the curve is perfectly symmetrical round its center; in other words, the C. of a circle is constant. In different circles, the C. is inversely as the radius—i.e., it diminishes as the radius increases. The reciprocal of the radius is accordingly assumed as the measure of C. of a circle. A straight line, which has no C., may be considered part of a circle whose radius equals infinity as the reciprocal of infinity, measures the C., and is = 0.

The constancy of C. in the circle suggests an absolute measure of C. at any point in any other curve; for whatever be the C. at that point, we can always find a circle of the same curvature. The radius of the circle which has the same C. at any point in a curve as the curve itself at that point, is called the radius of C. of the curve for that point; and the circle itself is called the *osculating* circle. If we know the radius of C. of a curve at different points, we can compare its C. at those points. We have thus the means also of comparing degrees of C. in different curves.

The problem of measuring the C. of a curve at any point is the same, then, with that of finding its radius of curvature. In some simple cases, as in the conic sections, this may be done geometrically; it is usually necessary, however, to employ the calculus. If the curve be referred to rectangular co-ordinates, and x, y be a point in it, then it can be shown that radius of C. $= \dfrac{\left(1+\frac{dy^2}{dx^2}\right)^{\frac{3}{2}}}{\frac{d^2y}{dx^2}}$. If the curved line, instead of being plane, twists in space, it is called a curve of double curvature. See CONTACT and OSCULATION.

CURVE means, in common language, a crooked line that departs gradually from the straight direction; in mathematics, however, it is usually restricted to lines that follow some law in their change of direction. Thus, the law of the circle is, that all points of it are equally distant from a fixed point, called the center. The law of a plane curve is generally expressed by an equation between the co-ordinates of any point in it referred to a fixed point. See CO-ORDINATES. When the equation of a curve contains only powers of x and y, the curve is algebraic; when the equation contains other functions, logarithms, for instance, of x and y, the curve is called transcendental. The cycloid, e.g., is a transcendental curve.

There are also curves, like the spiral, that do not continue in one plane; these are called curves of double curvature. To express the law of such a curve requires three co-ordinates and two equations.—Curves are said to be of the first, second, third, etc., order, according as their equations involve the first, second, third powers of x or y. The circle ellipse, parabola, and hyperbola are of the second order of curves. There is only one line of the first order, namely, the straight line, which is also reckoned among the curves.—The higher geometry investigates the amount of C. of curves, their length, the surface they inclose, etc.

The number of curves that might be drawn is, of course, infinite. A large number have received names, and are objects of great interest to the mathematician—in some cases, for their beauty; in others, for their remarkable properties. Among the most interesting are the following: 1, circle; 2, ellipse; 3, hyperbola; 4, parabola; 5, cissoid of Diocles; 6, conchoid of Nicomedes; 7, lemniscata; 8, cycloid; 9, harmonic curve; 10, trochoid; 11, the witch; 12, cardiode; 13, curves of circular functions—e.g., curve of sines; 14, the logarithmic curve; 15, the spiral of Archimedes; 16, the catenary; 17, the tractory; 18, the tractrix; 19, the ovals of Cassini; 20, the reciprocal spiral.

CURVES, ANTICLINAL AND SYNCLINAL, are terms applied to the elevations or depressions in undulating strata The ridge-wave is called the anticlinal curve, and the top of the ridge is known as the anticlinal axis; whilst the trough is the synclinal curve, and the bottom of the trough the synclinal axis.

CUR ZOLA (ancient, *Corcyra Nigra*, so called from the somber color of its pine forests), an island of the Adriatic, forming a part of the Austrian crown-land of Dalmatia, in lat. 42° 57′ n., long. 17° east It has a length of about 25 m., with an average breadth of 4

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milea. It is well covered with wood, which on the s. coast grows down to the water-edge. The woods furnish ship-timber, a considerable quantity of wine is raised, and the fisheries of the coast are productive. The population numbers altogether 11,000, about 2,000 of whom are located in the town of C., at the n.e. extremity of the island.

CUSCUS. See LEMON GRASS.

CUSCUTACEÆ. See DODDER.

CUSH, a cognomen, to theorize on which would be a waste of time. In Scripture, it seems to mean sometimes a man, sometimes a country. It is undoubtedly applied in general to the region s. of the Israelites; including portions of Africa s. of Egypt (Ethiopia, etc.), and probably also portions of Arabia. Other applications of it have been advocated, but remain unproved.

CUSHAT. See PIGEON.

CUSHING, CALEB, LL.D., 1800–79; b. Mass.; a lawyer of eminence. Politically, he began life as a whig, but, with President Tyler, he drifted over to the other side. He was often chosen a member of the Massachusetts legislature, and in 1835 was sent to congress. As commissioner to China, he negotiated our first treaty with that empire. He served as col. in the Mexican war; was made justice of the supreme court of Massachusetts, 1852; and was attorney-general of the United States, 1853–57. He was one of the counsel for the United States in the Geneva conference. He was a man of remarkable erudition, and great logical faculty; but his extraordinary abilities, though they did not fail of public recognition, seem to have failed of their due permanence of application.

CUSHING, FRANK HAMILTON, American ethnologist, was born July 22, 1857, at Northeast, Pa. His boyhood was spent on a farm in New York state, and at the age of 16 he began excavations on the sites of Indian camps. He had charge of a part of the National Museum collection at the centennial exposition at Philadelphia in 1876. From 1878 to 1881 he remained with the Zuñis of New Mexico and Arizona, being admitted to their tribal council after adopting their customs, and has reported many of their myths, etc. He was connected with the bureau of ethnology. Among his publications are *My Adventures in Zuñi* (1882–3); *Manual Concepts, or Hand-Made Mind* (1892).

CUSHING, LUTHER STEARNS, 1803–56; b. Mass.; an American lawyer, well known as a reporter of judicial decisions, and as the author of a *Manual of Parliamentary Practice*, 1845.

CUSHING, THOMAS, LL.D., 1725–88; b. Boston; a graduate of Harvard, and president of the general court, or legislative body of Massachusetts. He was a member of the provincial and Philadelphia congresses. In England he had the repute of being the great leader of the American rebellion.

CUSHING, WILLIAM BARKER, 1842–74; was born in Wisconsin, Nov. 24, 1843. During the civil war he was conspicuous for his ability and undaunted gallantry. His most remarkable feat was blowing up the Confederate ram *Albemarle* (Oct. 27, 1864), which threatened the destruction of the entire Union fleet, then lying off the coast of North Carolina. For this achievement he was made lieutenant commander. He was commissioned commander in 1872. He died of brain fever in Washington, D. C., Dec. 17, 1874.

CUSHMAN, CHARLOTTE SAUNDERS, b. Boston, 1816; d. there, 1876. She was of Puritan descent. Charlotte was the eldest of five children, left poor with the mother by the early death of her father. In the spring of 1830, she first sang at a public concert, and her fine contralto voice and good manner were at once approved. She appeared with success in *Marriage of Figaro* and other operas. In 1835, she went to New Orleans, where she suddenly lost the control of her voice, so far as singing was concerned. She was greatly disheartened, but at the request of a tragedian (Mr. Barton) she undertook her first dramatic part, "Lady Macbeth." She rapidly added such characters as "Romeo" (to bring forward her sister Susan as "Juliet"), "Elvira," "Bianca," "Helen McGregor," "Queen Gertrude," "Goneril," "Emilia," "Tullia," "Nancy Sykes," and the wonderful "Meg Merrilies." Later on she played both "Queen Catherine" and "Cardinal Wolsey" in *Henry VIII.*; also "Ophelia," "Pauline," "Viola," "Katherine" (in *The Shrew*), "Lady Teazle," and many other parts. While great in Shakespeare, she will be longest remembered as "Meg Merrilies." She visited England and the continent twice or thrice, and had exceptional triumphs in London and the principal cities of England and Ireland. She resided several years in Rome. It was not alone success in her art that made Charlotte Cushman celebrated. She was not only a great and good artist, but a good woman, honored in the most cultivated society in America and Europe. Her final appearance in New York, when she took leave of the stage of that city, was memorable. On the last night she played "Lady Macbeth." When the curtain fell, a body of the most eminent citizens, with William Cullen Bryant at their head, came upon the stage and presented the actress with a laurel crown, inscribed "C. C. Palmam qui meruit ferat." Miss Cushman never married. In 1880, her tomb in Mt. Auburn (near Boston) was marked by an obelisk, which is in form an exact copy of Cleopatra's needle as it stood at Heliopolis.

CUSK. See TORSK.

CUSP (Lat. *cuspis*, the point) is a point in a curve at which its two branches have a common tangent. If we conceive a curve to be generated by a moving point, then a C.

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is where the point suddenly stops and *returns* for a time in the same general direction as that in which it was moving when it reached the C. point. Cusps are of two kinds: 1, when the two branches have their convexities turned in the same direction with respect to the common tangent at the C. point; 2, when they have their convexities turned in opposite directions to the common tangent at the C. point.

CUSP, in architecture, is the point formed by the meeting of two small arches, or foils, in foil arches (q.v.) or tracery. Cusps often end in rich bosses of flowers and leaves.

CUSSO, KOSSO, or CABOTZ, *Brayera anthelmintica*, or *Hagenia Abyssinica*, a small Abyssinian tree of the natural order *rosaceæ*, sub-order *spiraceæ*, the dried flowers of which have been long used in Abyssinia as an anthelmintic.

CUST, ROBERT NEEDHAM, LL.D., was born in 1821 at Cockayne, Hatley, Bedfordshire, Eng.; educated at Eton, and, entering the East Indian service, took honors in the college of Fort William, Calcutta, for skill in four oriental languages. For many years he served with the military in various parts of India; took part in several battles, and was present at the taking of Lahore in 1846. He also took an active part in the Punjaub war of 1848–49, and in the pacification of the country after the mutinies of 1858. After his return from the east, he filled various local offices; became a member of several societies, and is a constant contributor to certain religious publications. Among his contributions to literature are: *Modern Languages of the East Indies* (1878); *Modern Languages of Africa* (1882); *Modern Languages of Oceanica* (1890), with several others.

CUSTARD, a composition of milk or cream, eggs, etc., sweetened with sugar, and flavored according to taste. M. Soyer gives the following recipe: Mix a pint of boiling milk with two ounces of sugar and the thin yellow peel of half a lemon; beat well four eggs in a basin, and add gradually the milk, etc. (not too hot); put through a colander, and place in custard cups over the fire in a stew-pan, containing about one inch of hot water, and leave them here until sufficiently set (about twelve minutes).

CUSTARD APPLE, the name commonly given in the West Indies and other tropical countries to the fruits of certain species of *anona*, a genus of trees of the natural order *anonaceæ* (q.v.). Some of the fruits of this genus are among the most delicious produced in tropical countries, as the cherimoyer (q.v.), and even the common C. A. (*A. reticulata*), which is regarded as a native of America, but is now very common throughout the East Indies, the variety cultivated in the Eastern archipelago being very superior even to the West Indian. The C. A. is a large, dark-brown, roundish fruit, sometimes from its size and appearance called bullock's heart in the West Indies; the tree is of considerable size. Some other American species of *anona* are sometimes called custard apples, and two or three which are natives of western Africa. To this genus also belong the sweet-sop, the sour-sop, the pinana or pinha, all of them tropical American fruits, and the ALLIGATOR APPLE of the West Indies (*A. palustris*), a fruit of pleasant taste, but regarded as dangerously narcotic.

CUSTER, a co. in s. part of Colorado; formed 1877; crossed by branches of Arkansas river; surface mountainous. Pop. '90, 2970. In the s.w. part, in Sangre de Cristo range, are rich silver mines. Area, 720 sq. m. Co. seat, Silvercliff.

CUSTER, a co. in s. central Idaho, drained by the Salmon river; pop., '90, 2176. Area, 3500 sq. m. Co. seat, Challis.

CUSTER, a co. in s.e. Montana, traversed by Tongue and Yellowstone rivers; surface hilly, soil fertile. Pop. '90, 5308. It has good pasturage. Co. seat, Miles city. The name was changed, 1877, from Big Horn. Area, 26,580 sq. m.

CUSTER, a co. in central Nebraska; organized, 1877; crossed by Middle Loup river; surface flat; soil rich. Pop. '90, 21,677. Area, 2592 sq. m. Co. seat, Brokenbow.

CUSTER, a co. in s.w. S. Dakota; in the Black Hills country; formed 1875; is well watered and timbered. Pop. '90, 4891. A chief industry is the mining of gold and silver. Co. seat, Custer. Area, 1615 sq. m.

CUSTER, GEORGE ARMSTRONG, 1839–76, was born at New Rumley, Ohio; he graduated at West Point in 1861, took part in the Richmond and in the Shenandoah campaigns, 1864–5; was major-general of volunteers in 1866 and lieutenant-colonel in the regular army the same year. He commanded in 1874 an exploration into the Black Hills. In the expedition of Gen. Terry against the Sioux Indians in 1876, he divided his regiment at the Little Big Horn River in Montana, in order to attack the Indians on two sides, but he and his whole regiment were killed June 25th. His widow, ELIZABETH BACON, became a noted and successful writer on the publication of *Boots and Saddles, or Life with Gen. Custer in Dakota* (1885). She has since published *Following the Guidon* and *Tenting on the Plains.*

CUSTIS, GEORGE WASHINGTON PARKE, an adopted on of George Washington, 1781–1857; b. Md. He was a grandson of Mrs. Washington—his father being her son by her first husband. Just after the surrender of Cornwallis, this son, John Parke Custis, died; and of his four children, two were adopted by Washington. C. was the only member of Washington's family who survived after 1852. C. studied at Princeton; and in 1802 went to reside on an estate of 1000 acres at Arlington, near Washington. His daughter married Robert E. Lee, afterwards general in the confederate

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army, and the grand estate was confiscated by the government, and is now the site of a union soldiers' cemetery.

CUSTODY. See IMPRISONMENT.

CUSTOM, in English law. This is either general or particular. The principal doctrines relating to general customs have been stated under COMMON LAW. Of particular customs, it may be remarked that, in order to establish them as law, they must be proved by verdict of a jury, except the C. of the city of London, which is proved by certificate by the lord mayor, aldermen, and recorder. A particular C. must, like a general C., be established as in force for a time whereof the memory of man runneth not to the contrary. See COMMON LAW. A C. must have been uninterrupted as regards right, though the exercise of it may have been disused; it must have been held without objection, and be unopposed to other customs; it must be not unreasonable nor uncertain in operation.

CUSTOMARY FREEHOLD, in English law, a species of estate which, in all practical respects, is identical with copyhold (q.v.), but in which the tenure is expressed to be according to the custom of the manor, without adding the words "at the will of the lord."

CUSTOM HOUSE, the office in a port of entry (seaport or lakeport), where masters of ships are bound to enter and clear their vessels according to the statutes governing the subject, and where importers of merchandise must pay customs duties. In the United States the custom house of each port is under the direction of a Collector of the Port, appointed by the President with the advice and consent of the Senate. He is responsible for its proper conduct, subject only to the direction of the Secretary of the Treasury, and it is his duty to carry out the United States statutes and tariff laws governing and restricting the importation of foreign goods. See CUSTOMS DUTIES.

CUSTOMS DUTIES, the portion of the revenue of the United States derived from a tax on imports. The use of the term began in England during the long conflict between the crown and parliament as to the right of taxation. To meet the claims made by the house of commons of the exclusive right to vote all supplies, it used to be maintained that there were certain duties on exportation and on importation to which the crown had acquired a right by *custom*, and after the power of parliament over this branch of taxation had been fully established, it retained its old name. This tax, after the excise came in force, was always applicable distinctively to goods changing place. There were customs not only upon things leaving and things coming to the British dominions, but also upon commodities transferred from one part to another. In Scotland, the duty on commodities imported into any town from a foreign country was called the great custom; and the duty charged by a burghal corporation on commodities coming from the country districts within its walls was called the small or petty customs. At present, the term C. D. applies solely to the tax levied on commodities imported from abroad.

The first national tariff law was adopted by the U. S., July 4, 1789, and laid the foundation upon which the protective policy has since rested. The preamble of the act states that the duties were levied for the purpose of raising revenue and protecting and developing native industry. The people of the U. S. have always opposed excise laws, and the method of raising revenues by customs duties has generally proved more popular. Between 1789 and 1816, no less than 5 general tariff acts increasing the rates of duty and adding articles to the dutiable schedules were passed; namely, in 1791, 1792, 1797, 1804, and 1812. It was not until the bill which became the tariff law of 1816 was pending in the house of representatives that the policy of protection underwent a scrutinizing investigation. Mr. Calhoun, of S. Car., had charge of the bill and defended it against John Randolph, of Va., who opposed it. Henry Clay also made an elaborate defense of the bill. In 1818 the rates of duty on some commodities were again increased on the recommendation of Pres. Monroe. On May 22, 1824, another general tariff act was adopted. As the revenue of the government at this time appears to have been sufficient, this act was passed for the purpose of giving our industries additional protection. By this time the tariff had become an issue, and the act of 1824 barely passed the house of representatives by a vote of 107 to 102. In 1828 another general tariff act was passed, which in spite of the adoption of some modifications in the act of 1832 brought about the sectional strife which ended in the state of S. Car. passing an ordinance declaring the tariff laws of 1828 and 1832 to be null and void, and putting the state in the attitude of readiness to resist their enforcement by military power if necessary. This led to the compromise act of Feb. 26, 1833, which received the almost unanimous support of the southern states. This act provided for a gradual reduction of duties until the ultimate rate should be 20 per cent. ad valorem on all protected articles, to be reached in 1842. Under this tariff the revenue declined, until in 1840 the issue of protection entered largely into the presidential campaign, and Gen. Harrison was elected on that issue. The principles of protection were revived again in the tariff bill of 1842, passed over the veto of Pres. Tyler. In 1846 the advocates of a revenue tariff came into power, and the revenue tariff was adopted in that year, and was continued till 1857, when another tariff, embracing substantially the same idea, was passed, and the duties reduced

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on all articles that illustrate the principles of protection. Soon after the passage of this act, a financial panic occurred, which the protectionists attributed to the revenue tariff, and with the advent of the Republican party and the outbreak of the civil war a distinctive protective tariff system was adopted and immediately put into force. On Mar. 2, 1861, a protective tariff was enacted, the rates were increased, and additional articles added to the dutiable schedules in acts passed, Aug. and Dec., 1861, 1862, 1864, 1865, and 1866. By these methods the revenue from customs duties was increased from about $40,000,000 in 1861 to $179,000,000 in 1869, while the value of merchandise imported during the same period had only increased from $335,000,000 in 1861 to $415,000,000 in 1869. Then followed the tariff acts of 1870, 1872, and of Feb. and Mar., 1875. These were in the line of reducing duties and enlarging the free list. In 1882 congress appointed a tariff commission consisting of 9 experts or specialists. This commission, after hearing 700 witnesses, framed a bill which with some changes in rates became a law in 1883, and is still in force. While the average ad valorem rate of duty on dutiable imports has remained about the same during the last 20 years, the free list has been largely increased until it has grown from one ninth of the dutiable list in 1870 to one half the present dutiable list. In 1887 $228,515,977 of merchandise was imported free of duty and $450,643,503 of the imports were dutiable. The effect of this increased free list has been to reduce the average rate of duty on all merchandise, dutiable and free, from 47 per cent. at the close of the war to about 30 per cent. at the present time. Since the foundation of the government, no less than 26 general tariff acts have been passed by congress. Since 1883, three attempts were made to reduce the tariff, but have either been defeated in the house of representatives or failed to pass the senate. In 1890 a bill, modifying the existing tariff in many important particulars, was introduced into congress, by Mr. William McKinley, representative from Ohio, and passed both houses. It reduced the tariff upon a number of articles, but increased it in the case of certain others, so that it cannot justly be described as anything more than a rearrangement of the former schedule. See FREE TRADE; TARIFF.

CUS'TOS ROTULO'RUM (Lat. keeper of the *rotuli* or rolls), one of the justices of the peace of a county appointed by the crown to keep the county records.

CÜSTRIN'. See KÜSTRIN.

CUTCH, a protected principality under the presidency of Bombay, stretches along the gulf of its own name and the Indian ocean between Guzerat and Sinde. It extends in n. lat. from 22° 45′ to 24° 40′, and in e. long. from 68° 26′ to 71° 45′, containing, in something of a triangular form with the maritime line as a base, an area of 15,100 sq.m., and a pop. of rather more than half a million. It is divided naturally into C. proper and the Rann of Cutch.—1. C. proper, consisting of 6,500 sq.m., and numbering nearly all the inhabitants, is the belt on the sea-shore, touching Sinde, of which it may be regarded as a physical continuation, on the n.w., and being separated by a detached portion of the Runn from Guzerat on the s.e. While the southern edge of this belt is merely a sandy desert, the northern section, traversed lengthwise by two parallel ranges of hills, presents, amid much sterility, many fertile tracts, which yield cotton, rice, etc., and feed a large stock of horses, kine, buffaloes, and camels. The grand defect of the country is the scarcity of water. Hence the crops occasionally fail from the scantiness of irrigation; and in the month of Mar., 1861, this region was said to be suffering more severely than almost any other in India from a nearly general famine. Timber is scarce, for the growth in the mountains is chiefly brushwood. Here and there, however, decayed trunks of great size, more particularly on the southern ridge, indicate the former existence of noble forests. The mineral productions are coal, iron, and alum. The traces of volcanic action are numerous. Earthquakes also have recently occurred; one of which, in July, 1819, besides shaking every fortification to its foundations, and destroying several hundreds of people, threw up an enormous mound of earth and sand many miles in extent, and simultaneously submerged an adjacent district of corresponding size. The pop. of the state was in 1891, 558,415, being about 86 individuals to a sq. mile. The ruler is styled the rao; and the feudatory chieftains under him are about 200.—2. Rann of C.—subdivided into two parts, the smaller, of 1600 sq. m., on the e., and the larger, of 7000 sq. m., on the n.—is merely an amphibious desert, being, in a great measure, hard ground during the dry season, and then, in turn, a sort of shallow lake formed by the heavy rains and pent-up tides of the s.w. monsoon. It is supposed to have been originally a permanent inlet of the ocean, and to have had its level raised by some such convulsion of nature as that which marked the year 1819. The periodical disappearance of the waters leaves behind it one continuous crust of salt. This dreary waste, however, is not without its elevated spots, the islets, doubtless, of a remoter era. Herds of wild asses and clouds of flies are its only inhabitants, and to cross it by day, except in the rainy season, is almost certain death.

CUTCH GUNDA'VA, a district in Beloochistan. The Hala range of mountains extends along the western frontier. The soil is rich, producing grain and cotton. The climate is damp and unhealthy.

CUTCH, OR **KACHH**, GULF OF, a portion of the Arabian sea, 110 m. long, running between Cutch and Guzerat.

CUTH'BERT, SAINT, OF DURHAM, one of the three great saints of England in the middle ages, the other two being St. Edmund of Edmundsbury, and St. Thomas-à-

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Becket of Canterbury. St. C. was b. about 685. Neither his birthplace nor his parentage has been ascertained; but a legend, which was long generally believed, told that he was born in Ireland, and drew his lineage from one of the petty kings of that country. When the light of record first falls upon him, he is a shepherd boy in the kingdom of Northumbria, which then stretched northwards to the Forth. In 651, while watching his flock by night on the heights of Lauderdale, he believes that he sees the heavens open, and a company of angels descend upon the earth, and again ascend to heaven, carrying with them the soul of St. Aidan, the pious bishop of Lindisfarne, or Holy island. The vision determines him to become a monk, and in the same year he enters the monastery of Melrose, of which St. Boisil was then provost or prior, and St. Eata, abbot. When the latter removed to the newly founded monastery of Ripon, St. C. accompanied him, and was appointed to the office of superintendent of the guests. In 661, St. Boisil died of the plague, which then ravaged Britain, and St. C. was chosen to succeed him as provost or prior of Melrose. While in this office, he distinguished himself by his assiduity in visiting the neighboring villages, and especially the remoter mountain hamlets, sometimes on horseback, but oftener on foot, and laboring by his teaching and example to reclaim the people from the superstitious or pagan rites into which they had fallen. After a few years spent in this way, he left Melrose for the island monastery of Lindisfarne, of which he became provost or prior, his old master, St. Eata, being abbot. Longing for an austerer life even than the monastic, he quitted Lindisfarne in 676, to become an anchorite, or solitary recluse, in a hut which he built with his own hands on Farne island. Here, in 684, he was visited by Ecgfrid, king of Northumbria, Trumuine, ex-bishop of the Picts, and other great men of the north, who came at the request of the synod of Twyford to entreat that he would accept the bishopric of Hexham. He reluctantly complies with their wishes, but his heart is still with his Northumbrian islands. He exchanges the see of Hexham for that of Lindisfarne, and still thirsting after solitude, at the end of two years he resigns his bishopric, and returns to his hut in Farne island. Here he died on the 20th of Mar., 687. The anniversary of his death was a great festival in the English church, which commemorated also the 4th of Sept., as the anniversary of the day on which his body was translated to Durham. The influence which St. C. exercised upon his age seems to have been due chiefly to his fervent piety and extraordinary asceticism. The gift of a persuasive tongue is ascribed to him, and he would seem to have had skill and prudence in the management of affairs, but nowhere is there any trace of his learning.

The fame of St. C. had been great during his life; it became far greater after his death. Churches were dedicated to him throughout all the wide country between the Trent and Mersey on the s., and the Forth and Clyde on the north. When his tomb was opened at the end of 11 years, it was believed that his body was found incorrupt, and so, for more than 800 years, it was believed still to continue. It remained at Lindisfarne till 875, when the monks, bearing it on their shoulders, fled inland from the fury of the Danes. After many wanderings through the s. of Scotland and the n. of England, it found a resting-place at Chester-le-Street in 882. It was transferred to Ripon in 995, and in the same year it was removed to Durham. Here, inclosed in a costly shrine, and believed to work daily miracles, it remained till the reformation, when it was buried under the pavement of the cathedral. The grave was opened in 1827, when a coffin, ascertained to have been made in 1541—when the body was committed to the earth—was found to inclose another, which there was reason to suppose had been made in 1104; and this again inclosed a third, which answered to the description of one made in 698, when the saint was raised from his first grave. This innermost case contained, not, indeed, the incorruptible body of St. C., but his skeleton, still entire, wrapped in five robes of embroidered silk. Fragments of these, and of the episcopal vestments, together with a comb and other relics, found beside the bones, are to be seen in the cathedral library. The asceticism which distinguished St. C. in life, long lingered round his tomb. Until the reformation, no woman was suffered to approach his shrine; the cross of blue marble still remains in the cathedral floor which marked the limits beyond which female footsteps were forbidden to pass, under pain of instant and signal punishment from the offended saint. His wrath, it was believed, was equally prompt to avenge every injury to the honor or possessions of his church. It was told that William the Conqueror, anxious to see the incorrupt body of the saint, ordered the shrine to be broken up; but scarcely had a stroke been struck, when such sickness and terror fell upon the king, that he rushed from the cathedral, and, mounting his horse, never drew bridle till he had crossed the Tees. A cloth, said to have been used by St. C. in celebrating mass, was fashioned into a standard, which was believed to insure victory to the army in whose ranks it was carried. Flodden was only one of many fields in which the defeat of the Scots was ascribed to the banner of St. Cuthbert. It hung beside his shrine until the reformation, when it is said to have been burnt by Calvin's sister, the wife of the first Protestant dean of the cathedral.

The life of St. C. was twice written by the venerable Bede—briefly in vigorous hexameters in his *Liber de Miraculis Sancti Cuthberchti Episcopi;* at greater length in prose, in his *Liber de Vita et Miraculis Sancti Cudbercti Lindisfarnensis Episcopi.* In this latter work, he made use of an earlier life by a monk of Lindisfarne, which is still preserved. Besides these lives—all of which have been printed more than once—and what

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is told of St. C. in Bede's *Historia Ecclesiastica Gentis Anglorum*, the chief ancient authorities are the *Historia Translationis S. Cuthberti*, published by the Bollandists in the *Acta Sanctorum, mens Martii*, vol iii.; the *Libellus de Exordio Dunhelmensis Ecclesiæ* by Symeon of Durham; the *Libellus de Nativitate S. Cuthberti de Historiis Hybernensium Excerptus*, and the *Libellus de Admirandis B. Cuthberti Virtutibus*, by Reginald of Durham, both published by the Surtees society. There are two modern memoirs of St. C.—the late Rev. James Raine's *St. Cuthbert* (Durham, 1828), and the very Rev. Monsignor C. Eyre's *History of St. Cuthbert* (Lond. 1849).

CUTHBERT, a disciple of the venerable Bede in the monastery of Jarrow, of which he himself was afterwards abbot, was present at the death of his master in 735, and has left a beautiful and touching relation of the event in a letter to his fellow-disciple, Cuthwine. It has been often printed; the best editions are those in Twysden's *Decem Scriptores* (Lond. 1652), and in Stevenson's edition of Bede's *Historia Ecclesiastica* (Lond. 1838).

CUTHBERT OF CANTERBURY, a native of the kingdom of Mercia, became bishop of Hereford in 736, and archbishop of Canterbury in 740. He died in 758. An instructive letter was addressed to him by St. Boniface (or Winfrid) on the ecclesiastical abuses of the age. It has been printed more than once, and will be found in the appendix to the late prof. Hussey's edition of Bede's *Historia Ecclesiastica* (Oxon. 1846)

CUTHBERT'S BEADS, ST. See BEADS.

CUTICLE. See SKIN.

CUTLASS. A short sword having a curved blade, strong and simple in make, used on board men-of-war as a portion of the arms of those stationed to board the enemy or repel boarders. The cutlass has a metallic guard for the hand and a very sharp point. At one time a groove was cut in the back into which a small amount of quicksilver was run. This was done with the view of increasing the force of the blow as the cutlass was swung round before the stroke was made.

CUTLER, LYSANDER, abt. 1806–66; b. Me.; a maj-gen. in the union army during the civil war, and commander of the famous "Iron Brigade."

CUTLER, MANASSEH, LL.D., 1742–1823; b. Conn.; graduate of Yale; a Congregational minister. He was interested in botanical studies. C. was the leader of the pioneers who settled Marietta, Ohio, and was a member of congress in 1801–5.

CUTLER, TIMOTHY, D.D., 1683–1765; b. Mass.; an American clergyman, graduate of Oxford, who became president of Yale college, 1719; but was forced to resign on account of his Trinitarian tendencies, went to England and was ordained a minister of the Episcopal church by the bishop of Norwich; returned to Boston and became rector of an Episcopal church, 1723.

CUTLERY, the general name for all kinds of cutting instruments, such as knives, forks, scissors, razors, etc. The workman who makes these is called a cutler; the swordmaker, a sword-cutler; but the manufacturer of workmen's tools is called a "tool-maker," or a "*steel toymaker*," not a cutler. In Birmingham, for example, such implements as hammers, chisels, pincers, hatchets, etc., are technically called toys.

Shells, and sharp-edged stones formed the rudest and most ancient cutting instruments. These were followed by bronze weapons and implements, which were in use among the Romans for some purposes up to about the time of the Christian era, bronze surgical instruments having been found at Pompeii. This bronze, like steel, could be made soft for working into shape, and then hardened, but by the opposite means used for hardening and softening of steel, bronze being softened by sudden cooling from a red heat, and hardened by slow cooling. Some cities in Spain and the n. of Italy acquired a high reputation for the manufacture of cutting instruments, more particularly swords, during the middle ages, when the chivalry of the period sought the best equipments. Latterly, all countries have been outstripped by England as regards tastefulness, excellence, and cheapness in cutlery. In this kind of manufacture, the lead is taken by Sheffield, which had gained a name for its *whittles* as early as the reign of Richard I. Why, with their ingenuity, taste, and skill in the arts, neither the French nor Belgians succeed in their C., would be difficult to explain. Certain it is that their C. is comparatively inferior as regards temper and finish, while their apparent incapability of making the delicate hinges and springs of clasp-knives has provoked repeated remark. At the same time, it is to be allowed that foreign C. is rapidly improving, particularly in table-knives, on which a few years have made a great difference in France. In the manufacture of American axes, Canada has made most marvelous advances, its produce as respects this article excelling that of England.

Good *table-knives* are made of steel and iron welded together; the tang, which goes into the handle, and the shoulder, are of iron, and the blade of steel. The tang and shoulder are forged from bar-iron, and the blade from shear or cast steel. Knife-blades, razor-blades, and other small articles, are usually forged into their required shape while still attached to the bar, which serves for the workmen to hold them by, and is called the "porter." When the bar becomes too short, it is grasped in a pair of tongs held close by a ring which clamps them by sliding up their conical handles. Two men are

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employed in forging such work, which is said to be "two-handed." The principal workman, or "fireman," uses a small hammer of 2 to 4 lbs. weight, while the "hammerman" wields the sledge-hammer, weighing from 10 to 15 lbs. The "fireman," who attends the heating as well as the anvil-work, directs the hammerman, whose blows merely follow those of the small directing hammer of the fireman. In *drawing down* or *reducing* a bar both in length and width, the flat face of the hammer is used; but when the length or breadth alone is to be extended, only the "pane" or narrow edge of the hammer. The concavity of razor-blades is made by hammering the blade on a small round-faced anvil; the notch or "nail-hole" of a penknife is struck by means of a chisel of the required form. Superior work, such as razor-blades, are *smithed* after forging—that is, beaten upon an anvil, to condense the metal as much as possible—and slightly ground or *scorched* on a rough stone, to finish the shaping, and remove the "scale" or black oxidized surface, which would interfere with the color of the tempering. Common knives are made entirely of iron, and the difference of price arises not merely from the difference of cost of the material, but from the greater facility of working. It should also be understood that, in many articles composed of steel welded to iron, the saving of steel is not the only advantage, for steel being more brittle than wrought iron, it is very desirable, in all articles subject to a transverse breaking strain or to concussion, that every part except the cutting or working edge should be of iron. Thus, a hatchet made entirely of steel would be far less durable than one of iron with a welded steel cutting-edge. A table-knife with a steel tang would be weaker than one with an iron tang. Hammers should only be *faced* with steel, etc.

The great usefulness of steel for all kinds of implements used for cutting or exposed to wearing friction, depends upon its property of acquiring a high degree of hardness when heated and suddenly cooled, and of then being capable of softening again in various degrees by reheating moderately. See TEMPERING METALS.

Table-forks are forged rudely into the shape of the tang and shank, first as though but a single thick prong were required; the part for the prongs is then beaten out, and a stamping-die is brought down upon it, which forms the prongs, with a thin film of steel between them; this is cut out by a cutting-die. Then they are softened and filed up, again hardened, and tempered, and ground, to smooth and finish. The dry-grinding of forks, needles, etc., is a very deleterious trade, on account of the particles of steel which enter the nostrils of the workmen, and produce most painful irritation, followed by a peculiar disease called "grinders' asthma," which is said to shorten life so seriously that few dry-grinders, exposed to the steel dust, reach forty years of age. Many remedies have been proposed for this. A magnetic mouthpiece was invented; but the workmen would not wear it, on account of its novelty, its grotesque appearance, the trouble of cleaning it, and the belief that if their trade were made more healthy, greater numbers would enter it, and wages would be reduced. A revolving fan, which sets in motion a current of air, that is carried by a pipe to the outside of the building, has been used with greater success, and is now in general use when it can be applied, though its introduction was much opposed by the workmen. In the needle-trade especially, it has been most beneficial, entirely removing all danger from the operator. The use of wet stones would, of course, entirely obviate the evil, but they are not applicable to many kinds of work, especially that which is ground before hardening, as the stone wears away very rapidly under these circumstances.

Penknives and other pocket-knives are the work of many hands. Besides the blades, there are the separate pieces of the spring, the handle, rivets, etc., the making of each of which is a distinct trade. All these pieces are finally fitted and put together by the finisher; a good two-bladed knife passes through his hands from 70 to 100 times. The difference in the amount of labor bestowed on the best and the commonest C. is very remarkable, and the difference of price is, of course, proportionate.

CUTTACK, the district, is in the province of Orissa, on the n.w. coast of the bay of Bengal, and has an area of 3633 sq. m., and a population, '91, of 1,938,000. The name, however, has sometimes been used to include the three districts of C., Puri, and Balasore, with a joint area of 8172 sq. m., and a population of 3,878,000. This larger district extends in n. lat. from 19° 40′ to 21° 45′, and in e. long. from 85° 8′ to 87° 31′. The Mahanuddee is the main river, its delta being wholly comprised within the district. Among the natural features of the country, the most remarkable is the Chilka lake, which is for many miles separated from the sea by a strip of sand not more than 300 yards wide. Next to Cuttack, the chief towns, reckoning from the s. are Pooree, with its temples of Juggernaut, at the mouth of the most southerly arm of the Mahanuddee; Kanarak, or the Black Pagoda, about 20 m. further to the n.; and Balasore. The trade of the district is inconsiderable. Iron ore is said to be found.

CUTTACK' ("royal residence"), the capital of a district of its own name in the province of Orissa, presidency of Bengal, stands immediately below the bifurcation of the Mahanuddee, thus occupying the apex of the delta of that river. The advantage, however, of this position, in a political and commercial point of view, seems to be in a measure neutralized by the cost of providing against the encroachments of the bordering streams. With a population in 1891 of 47,200, the city has no pretensions to architectural beauty. It has very little trade; but is famous for its fine work in gold and

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silver ornaments. C. is 220 m. s.w. of Calcutta, in lat. 20° 28′ n., and long. 85° 55′ east.

CUTTER, the name given to a portion of the equipment of boats on board of a man-of-war. The boats are double banked and are fitted either for rowing or sailing, if for the latter, the rig that has been adopted for the navy is the "sliding gunter." In sailing-ships a nest of cutters of varying sizes used to be stowed in amidships, one within the other, the launch being the bottom boat of all. At present the boats are either swung at the davits or in cradles resting on frames in amidships clear of the blast of the guns. A large ship carries as many as four pulling cutters in addition to a steam cutter and various other boats (see BOATS). The name cutter is also applied to a small vessel with a single mast, a mainsail, a forestaysail, and a jib set to the bowsprit end. Cutter yachts are sloop-rigged vessels, and the name is now generally applied to sloops of considerable draft and comparatively small beam. A revenue cutter is a light armed government vessel commissioned for the prevention of smuggling and the enforcement of the customs regulations. A small, light sleigh with a single seat for one or two persons, usually drawn by one horse, is also called a cutter.

CUTTER. A name sometimes applied to a front tooth, as distinguished from a grinder. It is therefore equivalent to *incisor.*

CUTTINGS are branches or portions of branches of trees or shrubs, employed to produce new plants, by the insertion of the lower end into the earth. By care, and in the most favorable circumstances, almost any tree or shrub may be propagated by C., but some only with great difficulty, and soft-wooded trees or shrubs most easily. Nothing is more easy than to propagate willows, fuchsias, currants, gooseberries, etc., in this way; but many other plants, commonly propagated by C., require greater attention on the part of the gardener, warmth, a uniform damp atmosphere, and shade. Some kinds of apple are occasionally propagated by C., and in warmer climates than that of Britain, this mode of propagation is found suitable for a greater number of kinds. C. are most advantageously taken from branches of which the wood is young, yet at least a year old. The top is generally cut off, and not much more left above ground than is inserted into it. Care must be taken in planting C. not to use such force as to strip off the bark. Some herbaceous plants are propagated by C., which, in pinks and carnations, are called *pipings.*

CUTTLE-FISH, *Sepia* and *Sepiadæ,* a genus and family of cephalopodous mollusks of the order *dibranchiata.* See CEPHALOPODA. The body is oblong and depressed, sac-like, with two narrow lateral fins of similar substance with the mantle. There is an internal shell lodged in a sac on the back part of the mantle, somewhat oval and blade-shaped, being comparatively thick near the anterior end, where it is terminated by a sharp point affixed, as it were, to its general outline; the whole shell is light and porous; it is formed of thin plates with intervening spaces divided by innumerable partitions; and consists chiefly of carbonate of lime with a little gelatinous and other animal matter, which is most abundant in the *phragmocone,* or internal harder part of the shell, where also the laminæ and partitions are closer than in the outer part. The eyes are very large, and the head is furnished with eight arms, each of which has four rows of suckers, and two long tentacles expanded and furnished with suckers on one side at the extremity. The COMMON C. (*sepia officinalis*) is abundant on the British coasts. Its skin is smooth, whitish, and dotted with red. It attains the length of a foot or more. It is one of the pests of fishermen; often, along with calamaries, partially devouring the fish which have been caught in their nets. In Scotland, the fishermen call it the O fish. It is not itself easily caught, being very active in making its escape by swimming, and also promptly throwing out its ink to darken the water around it. It is sometimes cast upon the shore, but far more frequently its bone, which is used for making pounce, tooth-powder, etc., for forming molds for small silver castings, for polishing, and for other purposes in the arts; and was formerly often used in medicine as a corrective of acidity in the stomach, for which purpose, however, it is no better adapted than any other form of carbonate of lime. The ink of the C. furnishes the valuable pigment called *sepia* (q.v.), which is said by some chemists to contain a peculiar animal principle called *melanine* (Gr. *melas,* black), and is wonderfully indestructible. Dr. Buckland indeed found the pigment remaining in fossil mollusks akin to the C. to be fit for use, and to make excellent sepia, notwithstanding all the unreckoned ages that have elapsed from the time of its secretion by the living organisms.—The eggs of the C. are not unfrequently cast ashore, clustered together like grapes, and are known to the frequenter of the coast as *sea-grapes.* See illus., MOLLUSKS, vol. X.

CUTTY STOOL, a seat once used in the Scottish church for the exposure of offenders against chastity. The sinner was required to sit on the stool before the whole congregation and endure a lecture from the minister.

CUT-WORM, a somewhat indefinite name for destructive grub worms of various species, many of which belong to the genus *agrotis.* The most destructive are the

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winter dart-moth and the wheat dart-moth, destroying the germs of wheat and buckwheat. Sometimes they devastate whole fields of corn, cabbage, and other vegetables. One species ravages the young buds of apple and pear trees. No prevention has yet been found effective.

CUVIER, Georges Chrétien Léopold Dagobert, Baron, was b. Aug. 23, 1769, at Mömpelgard, a t. then belonging to Würtemberg, but now to France. His father was an officer in a Swiss regiment. Having made rapid progress in learning at the Montbéliard gymnasium, C. entered, in 1784, the Karlsakademie at Stuttgart. Here, in the midst of various studies, he retained that predilection for natural history which he had displayed when only 12 years old. The restricted means of his parents, however, compelled him, in 1788, to take a situation as private tutor in the family of comte d'Héricy, who resided near Fécamp, in Normandy. Here C. lived for 6 years, quietly but ceaselessly pursuing his studies in natural history. An acquaintance accidentally formed between him and the abbé Tessier (noted as a writer on agriculture), was the cause of C.'s obtaining an introduction to Geoffroy St. Hilaire and other eminent Parisian savans. Startled by the novelty and comprehensiveness of his views on zoology, Geoffroy St. Hilaire urged him to come to Paris, which he did, and, in 1795, was appointed professor in the *ecole centrale* of the Panthéon. Soon after this appointment, C. was made assistant to Mertrud, the teacher in comparative anatomy at the *Jardin des Plantes*, and now he began to form that collection in natural history which ultimately became the largest in Europe. In 1796, he was made a member of the national institute; in 1800, he succeeded Daubenton in the collége de France, and, in 1803, he was made perpetual secretary of the institute. He gradually rose in the estimation of the emperor, and, in 1808, was commissioned to superintend the institution of academies in the new territories attached to France. Shortly before the fall of Napoleon, C. was admitted into the council of state. The restoration did not deprive him of his honors, but added to them; he was made chancellor of the university of Paris, and, henceforward, received from time to time new rewards for his services to science. After a visit to England (1818), where he was received with great honors, he was, in 1819, admitted into the cabinet by Louis XVIII., and, in 1826, was made grand officer of the legion of honor; but his decided opposition to the royal measures for restricting the freedom of the press, lost him the favor of Charles X. Under Louis Philippe, he was made a peer of France in 1831, and in the following year was nominated minister of the interior, when he was suddenly attacked with paralysis, of which he died, May 13, 1832.

It is difficult, in our narrow compass, to give a summary of the merits of C., so various were his attainments, so great was his success in so many departments. He laid the foundation of the now universally recognized method of classification in zoology (q.v.), and raised comparative anatomy (which until his time had been merely a heap of unconnected details) to the dignity of a science. After a long series of patient observations on numerous animals, especially the hitherto little-known order of mollusca, he published (1801–5) his *Leçons d'Anatomie Comparée*, which was completed by the *Mémoire pour servir à l'Histoire de l'Anatomie des Mollusques* (1816). With admirable sagacity, he applied the principles of his comparative osteology to the remains of fossil vertebrate animals, and thus opened a field of investigation in which numerous explorers have since successfully labored. His *Recherches sur les Ossements Fossiles des Quadrupèdes* (1821–24) is a mine of information in natural history, and affords the strongest arguments in favor of the theory of a progressive series of animals, advancing from the most simple to the most complex forms of organization. C.'s rare faculty of expressing scientific truths in a popular and elegant style, was displayed in his celebrated *Discours sur les Révolutions de la Surface du Globe et sur les Changements qu'elles ont produits dans le Règne Animal* (latest edition, Paris, 1851). This discourse was published as an introduction to the above-named *Recherches sur les Ossements Fossiles*. In concert with Valenciennes, C., in 1828, commenced a *Natural History of Fishes*, which was founded on the largest ichthyological collection ever made by an individual. It was continued by Valenciennes. Lastly, we may notice the éloges delivered by C. (and published in the *Recueil d'Eloges Historiques*, 1819), as valuable contributions to the history of science.

In public life, C. was as remarkable for activity as in the quiet work of the study. He never blindly surrendered himself to any party, but at all times gave proof of an honest, sagacious, and resolute character. In his plans for the extension and improvement of national education, he was zealous and indefatigable, as also in his efforts for the welfare of the Protestant church in France, of which he was a member.—Mrs. R. Lee's *Memoirs of Baron C.* (Lond. 1833); Pasquier's *Eloge de C.* (Paris, 1833).

CUXHA'VEN, a t. of Germany, situated on the left or southern bank of the Elbe, just where it is lost in the German ocean. It is about 60 m. distant from Hamburg, to which free city it belongs. C. is a small place, but of importance as the port from whence the Hamburg steamers ply when in winter the Elbe is frozen over. The harbor affords good shelter, and is much resorted to by vessels waiting for favorable winds. Pilots for the Elbe are taken in here. Pop. '90, 4905.

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CUYA'BA, capital of Matto Grosso, the second largest and most westerly province of Brazil, occupies pretty nearly the center of South America, being in lat. 15° 36′ s., and long. 56° west. It stands on the left bank of a river of the same name, and was estimated in 1893 to contain 20,000 inhabitants. Its mines, which have yielded gold and diamonds since 1719, are now nearly abandoned, the cost of working them being unremunerative. C. sends to Rio, the principal seaport of the country, large quantities of hides and ipecacuanha. It contains barracks, an arsenal, and other public buildings, and is the seat of a bishop. The C. river is navigable, and steamers from Paraguay visit the city. It has a hot but not unhealthful climate.

CUYAHO'GA, a co. in Ohio, bordering on lake Erie, traversed by several railroads; 480 sq. m.; pop. '90, 309,970. Productions, grain, wine, butter, and wool. Co. seat, Cleveland.

CUYLER, THEODORE LEDYARD, D.D., b. N. Y., 1822; graduated at Princeton; first a Presbyterian minister in New Jersey; then pastor of Market street Reformed church, New York; and pastor of Lafayette avenue Presbyterian church, Brooklyn, from 1860 to 1890, when he resigned the active charge, and was presented with $1000 for each of the 30 years of his pastorate. He has written many religious works, and a large number of articles in religious newspapers.

CUYP, or KUYP, JACOB GERRITSE, commonly called the old C., was b. at Dordrecht in 1575. Jacob C.'s representation of cows and sheep, battles and encampments, are clever, but his fame rests principally upon his excellent portraits. His coloring is warm and transparent; his manner, free and spirited. C. died in 1651.—AELBERT CUYP, Jacob's son, was also b. at Dordrecht, in 1605. He excelled in the painting of cattle grazing or reposing, moonlights, wintry landscapes, still waters with ships, horse markets, hunts, camps, and cavalry-fights. During his lifetime and long after, Aelbert's pictures, although in many respects equal to those of Claude, were held in little estimation. Opinion, however, has now changed regarding them. One of his still waters, which was sold in 1777 for 416 guilders (about $170), brought 12,720 guilders ($15,300) in 1844. England is particularly rich in his works. He died at Dordrecht, 1691.—BENJAMIN CUYP, a nephew of Aelbert, lived at Dordrecht, and painted biblical pieces in Rembrandt's style, and familiar scenes of country life. His best works are in the manner of Teniers. His sea-shores have less repute. The dates of his birth and death are unknown, but, from the multitude of his pictures, it is conjectured that he lived to a great age.

CUZ'CO, the name of a city, a province, and a department in Peru. 1. C., the city, was originally the capital of the Incas (in the language of the Incas, says Garcilaso, C. signifies "navel") and the center of an empire; which, besides the territory of the existing republic, comprised Bolivia, most of Ecuador, and portions also of Chili and the Argentine confederation; and was once, next to Lima, the most populous city in the state. Its pop. in 1889 was estimated at 22,000. It stands on the Guatanai, one of the remotest head-waters of the Amazon, in lat. 13° 31′ s., and long. 72° 2′ w., at the eastern end of that section of the Andes known as the Knot of Cuzco, 11,000 ft. above sea-level. Notwithstanding its aboriginal name, C., with the exception of some neighboring ruins, part of which, perhaps, carry one back beyond the era of the Incas, is really of Spanish origin, being built in the form of a square, and presenting many handsome edifices. It is about 200 m. to the n.n.e. of Arequipa, having its maritime outlet in Islay, the port of that city. The manufactures of the place are cottons, woolens, embroidery, and jewelry.—2. The province, otherwise styled the Cereado, embraces nothing beyond the city itself but the suburb of San Jeronimo.—3. The department, subdivided into 11 provinces, lies wholly in the sierra or andine region of the country, having the coast on the w., and the montana, or transandine territory, on the east. It now numbers about 238,455 inhabitants, being considerably more populous than any other department. Its area has been variously estimated at from 27,000 to 95,500 sq. miles. In addition to C. itself, it has the towns of Abancay and Urubamba.

CY'AMUS BALÆNA'RUM. A crustacean parasite infesting the skin of the whale; the whale-louse.

CY'ANE, a nymph, wife of Eolus, the god of the winds. The legend was that Pluto changed her into a fountain.

CYAN'IC ACID (new name, ISOCYANIC ACID or CARBIMIDE) is a compound of cyanogen (q.v.) with oxygen and hydrogen, and is represented by the symbol HNCO. It is chiefly interesting because the potassium salt, KNCO, obtained by fusing potassium cyanide with litharge, PbO, is the first step towards the artificial preparation of urea (q.v.).

CY'ANITE, KYANITE (Gr. *kyanos*, blue), DISTHENE or SAPPARE, a mineral composed of alumina and silica. It often occurs crystallized, and generally in broad prisms. It is sometimes colorless, red, yellow, etc., but frequently of a fine sky-blue, slightly tinged with violet; it is transparent, and sometimes beautifully opalescent. It occurs chiefly in mica-slate, talc-slate, and granite; is found in different parts of Europe, Asia, and America, and also on New York island. It is sometimes used as a gem.

CYAN'OGEN, DICYANOGEN, C_2N_2. This gas, discovered by Gay-Lussac, is mainly interesting as being the principal component of hydrocyanic or prussic acid. It is most

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easily prepared by heating the cyanide of mercury, HgCy, or the cyanide of silver, AgCy, in a tube, when the C. is evolved as a gas at ordinary temperatures, but can be condensed by cold and pressure into a thin, colorless liquid, which freezes at −30° F. (−34.4° C.). Gaseous C. has a specific gravity of 1806 (air = 1000), is inflammable, and burns in air or in oxygen with a characteristic purple or rose tint; is soluble in water to the extent of 1 volume of the gas in 4 of water. Its odor resembles peach kernels, and it is very poisonous. It combines with metals, such as potassium, to form a class of important cyanides, as the cyanide of potassium. See POTASSIUM, HYDROCYANIC ACID, etc.

CYANHY'DRIC ACID. See HYDROCYANIC ACID.

CYANOM'ETER, an instrument for determining the color of the sky; a disk divided into sections, the several sections being tinted with blue, gradually increasing in intensity. If the sky be viewed through it, some of its sections will appear deeper and some lighter in tint than the sky. The section where there is no perceptible difference gives the measure or degree of the blueness of the sky.

CYANO'SIS (Gr. *kyanos*, blue), lividity of complexion, with fullness of the capillaries and minute veins, especially of the face and lips. A name characteristically applied to the color in certain cases of congenital disease or malformation of the heart. See HEART, DISEASE AND MALFORMATION OF.

CYAN'OTYPE PROCESSES, in photography, are those in which the compound radical cyanogen is employed; they were discovered by sir John Herschel, and depend for their successful practice on the reduction of a persalt of iron to the state of protosalt, by the action of light, in the presence of organic matter.

Good paper is immersed in a solution of ammonio-citrate of iron of the strength of 40 grains to one ounce of water; it is then dried, and exposed—at any convenient time during a fortnight—under a negative, when a picture of a pale brown tint becomes faintly visible upon a yellow ground; it is then brushed over with a solution of ferrocyanide of potassium (yellow prussiate of potash), which develops the picture of a deep blue tint; and this may be further deepened by immersion in a solution of carbonate of soda, which has the effect, at the same time, of removing the unaltered ammonio-citrate, and permanently fixing the picture. Similar results may be obtained by employing ferridcyanide of potassium (red prussiate of potash), or a mixture of the ferridcyanide and ammonio-citrate, in which latter case the paper is sensitive as soon as treated with the mixed solutions, and must therefore be dried in the dark. To fix the picture, it is only necessary to wash with water. A subsequent treatment with a weak solution of proto-nitrate of mercury, has the effect of apparently removing the whole of the picture. If the mercury salt, however, be perfectly washed away, and the picture dried, and ironed with a very hot iron, it is speedily reproduced in all its vigor.

CYANU'RIC ACID, ISOCYANURIC ACID or TRICARBIMIDE, is an organic acid allied to cyanic acid, and having the formula $C_3N_3(OH)_3$. It is obtained by action of heat on urea, which gives off ammonia, or by the destructive distillation of uric acid.

CYATHE'A, a genus of ferns (q.v.), of the sub-order *polypodiaceæ*, containing many species, natives of tropical and sub-tropical regions, both of the old and of the new world. They are tree-ferns, and some of them have lofty stems and gigantic fronds; they are generally also characterized by great gracefulness and beauty. *C. arborea*, sometimes designated the common tree-fern, is a native of the West Indies, Brazil, etc. The fronds are bipinnate, the pinnules deeply pinnatifid. The roots of *C. medullaris*, a species found in New Zealand, contain much starch, and are baked and used as food.

CYATHOPHYL'LUM, a genus of fossil stony corals, with a simple or branched polyparium, internally lamellated, the lamella having a quadripartite arrangement. The older portions are cut off by transverse "tables" or septa, and the base of the stem is often supported by root-like processes. This genus was especially abundant in the Devonian measures, 86 species having been described from them. It made its first appearance in the Silurian seas, and perished at the close of the carboniferous epoch. See illus., SILURIAN AND DEVONIAN FOSSILS, vol. XIII.

CYATHUS, a Roman measure, both dry and liquid, containing the twelfth part of a *sextarius*, or pint. The name is also given to a small ladle used for transferring wine from the mixing-bowl to the drinking-cup.

CYAX'ARES I., King of the Medes, who began to reign about 663 B.C. In 610 he was at war with the king of Lydia, when there occurred an eclipse of the sun, whereupon the kings made a treaty of peace.

CYAX'ARES II., grandson of Cyaxares I., and uncle of Cyrus the Great, supposed to be the "Darius the Mede" spoken of by the prophet Daniel. He reigned in Babylon two years after its conquest by Cyrus.

CY'BELE, or RHEA CYBELE, was the daughter of Uranus and Gê, and the wife of Cronos, by whom she became the mother of Zeus and the order of deities of which he was head. She was sometimes called the "mother of gods," and was known by several other names. Her name, *Cybele*, was the Phrygian word for *cave*, and under that name she was worshiped as the goddess of caves, mountains, and the haunts of wild animals, and was thought of as always attended by panthers and lions. The lion was sacred to her. In Galatia she was worshiped with great solemnity as Agdistis. She was also known in this province as Dindymene from a mountain sacred to her. Sometimes she

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was worshiped as the goddess of agriculture, vine-growing, and town-life. Her worship was of a wild enthusiastic nature, with much dancing and music, and the Corybantes (q.v.) were her priests. In works of art she is usually represented as seated on a throne, adorned with a mural crown, from which a vail is suspended. At either side of the throne are lions, or perhaps a lion lies on her lap or under her feet. Sometimes she is seen riding in a chariot drawn by lions.

CYB'IUM, a genus of fishes of the family *scomberidæ* (q.v.), having a long first dorsal, detached finlets, an elongated body, a keeled tail, no pectoral cuirass, and no armature on the lateral line, compressed trenchant teeth in the jaws, and very numerous villiform teeth in other parts of the mouth. A number of species are natives of the seas of the East Indies, some of which are much esteemed for the table.

CYCADA'CEÆ, or **CYCAD'EÆ**, a natural order of exogenous plants, consisting of small trees and shrubs, somewhat resembling palms in their general appearance, but much more nearly allied to *coniferæ* (pines, firs, etc.) in their botanical characters; C. being one of the few orders placed by Lindley along with *coniferæ* in his class of *gymnogens* (q.v.). The stems are generally simple, and either cylindrical or short and spheroidal; sometimes they are branched by successive forkings; they are much marked with scars of leaf-stalks; they consist internally of a mass of pith traversed by woody bundles, and rings of woody matter. The leaves are large and pinnated, and unfold by unrolling, like the fronds of ferns. This curious and beautiful order contains about 50 known species, natives of tropical and sub-tropical countries. None are found in Europe. They all have a mucilaginous nauseous juice, but with this there is often much starch, which, being separated, forms a wholesome article of food. A kind of sago is made in Japan from the cellular substance which occupies the interior of the stem of *cycas revoluta*, in the eastern peninsula from *C. pectinata*, and in the Moluccas from *C. circinalis*. From these species, which are trees 30 to 40 ft. high, there exudes a transparent gum, resembling tragacanth in its properties. Their nuts are also eaten, after being fermented and roasted. The large seeds of *dion edule* afford a kind of arrow-root in Mexico; and a starchy substance, sometimes called arrow-root, and sometimes sago, is obtained from *zamia pumila* and other dwarf species in the West Indies. Caffer bread (q.v.) belongs to this order.—Fossil C. are numerous, and occur in some of the oolitic and other strata in England.

CYCH'LA, a genus of fishes of the family *chromidæ* (included by Cuvier in the *labridæ*, or wrasse family), of which many species occur in the rivers of tropical America. They have small and crowded teeth, forming a large band. Some of them are reckoned among the finest fishes for the table in Brazil and Guiana. They are also remarkable for the beauty and brilliancy of their colors. Some of them are large, and some small. Allied to this genus is *chromis*, of which one species, *C. Nilotica*, is Egyptian.

CYCLADES (Gr. *Kuklos*, a circle), the name given by the ancient Greeks to a group of islands, nearly 60 in number, belonging to the Grecian Archipelago, from the belief that they encircled the holy island of Delos. They are, however, arranged in three nearly parallel lines, and appear to be remnants of an antediluvian mountain chain. All but one, Stampatia, belong to Greece, and they form a monarchy of that kingdom. The capital is Syra, on the island of that name. See ARCHIPELAGO and GREECE.

CYC'LAMEN, a genus of plants of the natural order *primulaceæ*, having a wheel-shaped corolla, with a long reflexed limb, and flower-stalks twisted spirally downwards after flowering. The species are herbaceous perennials, not numerous, and chiefly natives of the s. of Europe. They have turnip-like, partly subterranean stems, which are very acrid, but nevertheless are greedily eaten by swine, and the plants are accordingly often designated SOW-BREAD. They are drastic and emmenagogue. A very stimulant ointment is prepared from them, which externally applied by friction, expels intestinal worms from children. Several of the species are frequent in our flower-gardens, on account of the beauty and fragrance of their flowers.

CY'CLE (Gr.), which means simply circle, is a term used in chronology to denote an interval of time in which certain phenomena always recur in the same order. Cycles have chiefly arisen from the periods of revolution of the earth and other celestial bodies not being commensurable. One unit of time is the day of 24 hours, being the period of revolution of the earth round its axis. But neither the year—the period of the earth round the sun—nor the month—the period of the moon round the earth—can be measured by days, or even by hours, so exactly as not to leave fractions. Cycles have been invented to swallow up these fractions of time in whole numbers expressing days, in such a way that after a certain number of revolutions of the body whose period has been put against that of the earth on her axis, the body shall at last occupy the same place in the heavens and calendar as it did when the C. commenced. Of the numerous cycles or periods of this kind that have been invented, the more important are noticed under their specific names. See INDICTION, METONIC CYCLE, PERIOD, GOLDEN NUMBER, etc.

CYCLIC ANAPÆST. See METRICAL FEET.

CYCLIC CHORUS (Greek). The chorus which danced around the altar of Dionysius (Bacchus) in a circle, in contrast with the square choruses of the tragic drama. See CHORUS, DRAMA.

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CYCLIC DACTYL. See METRICAL FEET.

CYCLIC POETS, the "routine" writers of Greek mythological stories. The name was used in a derogatory sense, implying that the writers were mere followers of greater men. Their names are now scarcely known.

CYCLING. The early history of C.—in which generic term the use of all classes of manu and pedo-motive carriages is now by general consent included—is involved in obscurity. As long since as 1818, something in the nature of a bicycle was introduced into England by baron von Drais, a Frenchman resident at Mannheim, and was known as the Draisnene or Célérifère; while velocipedes, or manu-motive machines, with three or more wheels, were in occasional use in England even before that date, one of the earliest being an invention of Richard Lovell Edgeworth (*circa*, 1767). The Draisnene consisted of two wheels, about 30 inches in diameter, running one in the wake of the other, and connected by a beam of wood, upon which, midway from each end, was placed a saddle or perch. At the fore-end of the beam an arm-rest was secured, and this, roughly, completed the apparatus. The mode of propulsion was singularly simple: the rider placed his leg over the beam, got into the saddle, and, resting his arms upon the support referred to, pushed the "dandy-horse" ahead by kicking the ground with his right and left foot alternately When a certain impetus was attained, he could, were he a skillful rider, cease the kicking process, and allow the machine to proceed until the momentum was exhausted, when he had to commence *de novo*. It is hardly needful to say that the undignified attitude the rider perforce assumed was the subject of much ridicule; and it is not to be wondered at that the satire of Cruikshank and his contemporaries effectually killed the hobby-horse of 1818 It was introduced into the U. S. in 1819.

The fashioning of the first practical bicycle (*circa*, 1846), is currently credited to one Gavin Dalzell, a Scotch cooper, who lived at Lesmahagow, in Lanarkshire. It went by the name of the "wooden horse," being constructed chiefly of wood; the saddle was low, and the pedal movements or "stirrups," which moved backward and forward alternately, were connected by iron rods with the cranked axle of the driving-wheel.

The next revival of C. may be said to date from 1867. A few years previous to this it occurred to an inventive genius, one M. Michaux, to fit to the hobby-horse a pair of pedals by which the front wheel might be revolved with the feet. This, of course, meant that the rider must depend for his balance upon some means whereby the relative positions of the two wheels might be varied at will; in other words, some method whereby the base of the machine might be changed at pleasure. To this end, a transverse handle was affixed to the front wheel, which admitted of its being turned even to a right angle. This newcomer was known as the bicycle, but is now irreverently alluded to in all quarters as the "boneshaker"—probably because it was made of wood, and shod with iron tires instead of rubber, while springs were often conspicuous by their absence. The boneshaker craze was a serious one; it affected all classes of society, but chiefly—in consequence of the cost of the article—the middle and upper ranks; in witness whereof, the illustrated papers of 1867–69 contained more than one wood-cut showing the prince imperial upon his boneshaker in the Tuileries. One of the earliest of Michaux's bicycles found its way to Mr. Charles Spencer's gymnasium in London in 1868. So little was to be gained, and so much was to be lost—particularly in the way of appearances—by "boneshakerism," that in a few years it promised to become a lost art, when, happily, the inventive genius of an Englishman, whose identity is open to question, supplied the missing link—the rubber tire—which, with the suspension wheels and steel framing introduced at a later period, made the modern bicycle From the bicycle the tricycle was early evolved, chiefly through the instrumentality of James Starley, of Coventry, until the types of machines at present obtainable are practically endless.

The utility of the cycle is proved beyond all question. It is asserted on the best authority that a person of average capabilities can upon it travel at least 8, and frequently 6 times as far as he can walk in a day, and this with even less fatigue; while the possibilities of the machine in able hands will be admitted, when it is pointed out that a m. has been ridden upon a bicycle in less than two minutes and a half, and that 21 m. have been traversed well inside the hour, 50 m. in a little over two hours and a half, and 100 m. in considerably under 6 hours. The figures for longer distances are just as startling, for 300 m. have been covered in a day, and the road from Land's End to John o' Groat's —roughly, 900 m.—has been accomplished in 5 days one hour and a half! But the utility of the cycle is further proved by facts other than those given; it has become the poor man's carriage and the rich man's hobby in more senses than one. Royalty disports itself, at any rate in quasi-publicity, upon it; clergymen visit their parishioners; medical men their patients; and tens of thousands of business men transact their business by its means; while it is next to impossible to pass through any of the streets of our towns without seeing that the cycle, in some one of its numerous shapes, is ably ministering to the wants of the community. It was estimated that in 1888 not less than 500,000 machines were in use in Great Britain alone, a fact that will justify the assertion that cycle-making has become a very important industry.

So general has C. become, that in Great Britain alone, there are at least 20 C publications, varying from weeklies to annuals, besides roadbooks and handbooks innumerable. The cyclists' touring club of Great Britain has its headquarters at 139 and 140 Fleet st.,

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London, and encourages and promotes C. by appointing at one fixed tariff some hotel in every town as its headquarters, in having a member in nearly every town to guide visiting clubmen, etc. By agitating for better roads, for finger-posts and milestones, it has benefited travelers generally. It has 22,000 members and publishes an official *Gazette*, which is sent gratis to every member monthly. This club is international, nearly a dozen prosperous divisions having already been established in the U. S., in Canada, and on the Continent. C. possesses also a national cyclists' union that looks after the legislative side of the sport. The headquarters are at 57 Basinghall st., London, E. C. There are branches in Scotland, and Ireland has its cyclists' association.

C. is not only popular among men, but ladies innumerable have taken to the pastime, and their tricycles are commonly seen. The cyclists' touring club before referred to has nearly 1000 lady members. The cycle has been adopted by some of the leading London dailies to convey special editions to the various railway termini; and of much greater import is the official adoption of the two-wheeled machine by the military authorities of Great Britain, and a special cyclists' corps, known as the 26th Middlesex, has been called into existence. The capital invested in the cycle trade in England is considerably over a million sterling. The first American company for the manufacture of bicycles was established in 1878.

Many experiments have been made looking to the production of a successful electric tricycle, as well as to the application of steam to this form of instrument. An insurmountable difficulty has hitherto been found in the excessive weight that must necessarily be carried. This necessity might be obviated, in the case of an electric tricycle, by establishing accumulators along the roads frequented by cyclists, but at present this would be unprofitable. Since 1888, the bicycle and tricycle have been used to mount troops in the armies of Holland, France, Austria, and Germany, but rather by way of experiment as yet. In Germany the tricycle is preferred to the bicycle, as allowing a certain amount of luggage to be carried by the rider. In Italy, since 1881, bicycles have been used in the postal service.

In America, C. is becoming increasingly popular; there are flourishing clubs in all large cities, such as New York, Brooklyn, Philadelphia, Chicago, and Washington, and the club houses are more complete and better equipped than in Great Britain. The league of American wheelmen had, in 1888, about 12,000 members, and it was estimated that there were more than 60,000 cyclists in the U. S. Washington, with its miles of asphalted streets, as smooth and level as a floor, in 1888 claimed to have 4000 wheelmen and 300 lady tricyclists. One American wheelman is credited with having ridden 8000 m. in 1887, and another, 7000 m. More conspicuous is the tour around the world undertaken by Mr. Thomas Stevens, a ride occupying 3 years and involving an enormous amount of endurance, pluck, and energy. Among other feats of bicycle riders may be added the "straightaway" ride from San Francisco to Boston (over 3000 m.), the longest continuous journey on record; and the covering of 1466 miles in 6 days in N. Y. City, Oct. 1891. Manufacturing enterprise has kept pace with the demand, the yearly production (at Boston, Chicopee Falls, Chicago, etc.) being estimated at 10,000 machines, and America is well supplied with C. literature. Among the periodicals are the *Bicycling World*, the *L. A. W. Bulletin and Good Roads*, published in Boston; and *The Wheel*, published in New York. See BICYCLE.

See *Cycling*, by viscount Bury and G. L. Hiller (Badminton Series, 1888); Spencer's *Bicycles and Tricycles, Past and Present* (1883); Dr. Richardson's *Tricycle in Relation to Health and Recreation* (1885); Stable's *Health upon Wheels* (1885); *Art and Pastime of Cycling;* Stevens's *Around the World on a Bicycle* (1887).

CYCLOBRANCHIA'TA (Gr. circle-gilled), an order of gasteropodous mollusks, in which the gills usually form a series of lamellæ, surrounding the body between the foot and the mantle. To this order belong the univalve *patellidæ*, or limpets, and the multivalve *chitonidæ*, or chitons.

CYCLOGRAPH, an instrument devised by Mr. T. P. Worthington, 1880, for drawing curves of long radius, and intended to replace the use of the trammel bar and of cardboard curves. Two small discs are so arranged that one may be fixed on the end of a spindle, and the other left free to slide, but capable of being fixed at any point. This latter is of smaller diameter than the other, which allows the drawing of a curve of any radius. When the discs travel together over a plane surface radii between 3 and 10,000 ft. may be described. On the axis between the two wheels a pencil is mounted which makes the desired tracings upon the paper. The fixed disc is nicely graduated; and the instrument is both ingenious and useful.

CY'CLOID (Gr. circle-like). If a circle roll along a straight line on its own plane, a point on the circumference describes a curve which is called a cycloid. The curve is one of the most interesting we know in respect both of its geometrical properties and connection with dynamics. One of its most interesting properties is this: The time of a body's descending from rest from any point in the arc of an inverted C. to the lowest point is the same, from whatever point of the curve the body begins to descend. This is sometimes expressed by saying that the C. is the *isochronous* (Gr. equal-time) *curve*. The body having reached the lowest point, will, through the impetus received in the

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fall, ascend the opposite branch of the curve to a height equal to that from which it fell, losing velocity in its ascent by the same degrees as those by which it acquired it in its descent, and it will employ precisely the same time in ascending as it did in descending. It is clear that if a surface could be procured that would be perfectly smooth and hard, the C. would thus present a solution of the perpetual motion. The curve was discovered by Galileo in 1615.

CYCLOID FISHES, an order of fishes, according to the classification proposed by Agassiz, having *cycloid* scales (Gr. *kyclos*, a circle)—scales formed of concentric layers, not covered with enamel, and not spinous on the margins. Cycloid scales are generally imbricated, but are sometimes placed side by side without overlapping. Very many of the existing fishes are of the cycloid order, and fossil C. F. are numerous.

CYCLONES. See STORMS.

CYCLOPÆ'DIA. See ENCYCLOPÆDIA.

CYCLOPE'AN ARCHITECTURE, or MASONRY, the name which has come to be generally used for a wall of large irregular stones, unhewn and uncemented. The term originated in Greece, where structures of this kind were fabled to have been the work of the Cyclops, or one-eyed giants. The walls of Tiryns, near Nauplia—alluded to by Homer—are an example of the ruder style of Cyclopean masonry. They are of irregular unshapen stones, from 6 to 9 ft. long, from 3 to 4 ft. wide, and from 2 to 3 ft. deep; the interstices are filled up by small stones, but no mortar is used. The walls of Mycenæ and of Epirus are examples of more advanced C. A.: here, the blocks, although irregular in size and shape, are fitted carefully to each other, showing close joints and a smooth surface. These structures are now commonly believed to have been reared by the Pelasgians (q. v.), probably more than a thousand years before the Christian era. They are found not only in Greece, but in Italy and Asia Minor. See illus., ARCHITECTURE, vol. I., p. 640, fig. 8.

The next stage of Cyclopean masonry shows an approach to horizontal courses, as in the walls of several towns in Greece, and of some in Etruria (q.v.). Lastly, the name of Cyclopean work is applied, but perhaps not quite accurately, to a kind of masonry which obtained among the Etruscans, where the blocks are both squared and laid in horizontal courses, but are not cemented. In some cases—as in the walls of Cosa, in Tuscany, believed to have been first a Pelasgian, and then an Etruscan city—the lower part is of irregular polygonal blocks, the upper part of squared stones in horizontal courses. In at least one instance—a wall in the Peloponnesus—a foundation of excellent ashlar is surmounted by irregular polygonal blocks of the usual Cyclopean type.

Masonry, partaking more or less fully of the Cyclopean character, is to be found in Persepolis, and elsewhere in Asia, in several parts of western Europe, and in some parts of America. The walls of Cuzco, and the ruins of what is called the house of Manco Capac, on an island in the lake of Titicaca, in Peru, are interesting examples of the C. A. of the new world. Instances of Cyclopean work on a smaller scale are to be found in the British islands, in the walls of the primitive "duns" or hill-forts, or in the "cashels" or precincts of early religious houses. Among Irish examples, may be mentioned the Grianan of Ailech, in the county of Donegal; Staigue Fort, in the county of Kerry; Dun Ængus, on one of the isles of Arran, on the w. coast of Galway; the Giant's Sconce, near Coleraine; and the Rock of Cashel. Among Scotch instances, may be named the Laws, in the parish of Monifieth, not far from Dundee, and the ruins on St. Columkille's island, near Migsted, in Skye. In the Bibliothèque Mazarine, at Paris, there is an interesting set of models of the Cyclopean buildings of Greece and Italy, by M. Petit-Radel, the author of *Recherches sur les Monumens Cyclopéens*.

CY'CLOPS (Gr. *kuklopes*, "the round-eyed"), in Greek mythology, are of three kinds. 1. The Homeric C., a wild, lawless, gigantic race, inhabiting the sea-coasts of Sicily, the most prominent of whom is Polyphemus (q.v.). Although Homer does not directly call them one-eyed, yet he expressly terms Polyphemus such, and the later poets attribute his peculiarity to the rest. 2. The three C. mentioned by Hesiod, Brontes, Stereopes, and Arges, each having one eye in the middle of his forehead; these were sons of Uranus and Gæa, belonged to the race of Titans, and forged thunderbolts for Zeus. Hurled into Tartarus by their father, but delivered by their mother, they helped Kronos to usurp the government of heaven. Kronos, however, in his turn, threw them back to Tartarus, from which they were again released by Zeus, whose servants they now became. Finally, they were slain by Apollo, because they forged the thunderbolt with which Zeus killed Asclepius. Later tradition placed their workshop in Mt. Ætna, or in the volcanoes of Lemnos and Lipari, and made them the slaves of Hephæstus. 3. The C. mentioned by Strabo, as a people who had come from Thrace or Lycia to Argolis, and were distinguished for their skill as builders. Their constructions are known as the Cyclopean walls, and many of them still exist in parts of Greece and Italy. The statement of Strabo is quite untrustworthy. More probably the so-called Cyclopean walls were built by some ancient race, perhaps the Pelasgians (q.v.), at a period long anterior to the historical civilizations of Greece and Rome.

CYCLOPS, a genus of minute entomostracous crustaceans of the order *branchiopoda* (q.v.), having a soft and rather gelatinous body divided into two portions, one consisting

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of the head and thorax, the other forming the tail. There is only one eye, situated in the middle of the forehead, and generally of a bright crimson color, sparkling like a gem when the animal is viewed through a microscope. The species of C. are numerous; they inhabit both the sea and fresh waters, generally residing among or upon aquatic plants. They are extremely active, and dart about with great rapidity.

CYCLOP'TERUS. See LUMP-SUCKER and SUCKING FISH.

CYCLORA'MA, a series of views, which, being wound round cylinders, are made to pass in consecutive order before the spectator, so as to produce the effect of motion on his part, as the banks of a river are seen from a steamboat, or the country from a railway.

CYCLO'SIS (Gr. circulation), the name employed to designate certain still very imperfectly understood movements of the contents of cells in plants. As they have been observed in plants of the most different natural orders, it is not unreasonably presumed that they prevail throughout the whole vegetable kingdom, and characterize the active life of all vegetable cells.

CYDNUS, a river of Cilicia, passing the city of Tarsus and emptying into the Mediterranean. It was on this river that Cleopatra made her voyage to meet Antony.

CYDO'NIA. See QUINCE.

CYG'NET, a young swan.—CYGNET-ROYAL, in heraldry, a swan gorged with a ducal coronet, having a chain thereunto affixed, and reflexed over its back.

CYG'NUS. See SWAN.

CYGNUS (Lat. the swan), a constellation in the northern hemisphere, between Lyra and Cassiopeia. Several stars in this constellation have received the particular attention of astronomers. See STARS.

CYL'INDER (Gr. *kylindo*, to roll) is the name of a genus of geometrical solid figures, of which there may be endless species. The most common kind of C. is that which is generated by the revolution of a rectangular parallelogram about one of its sides, which line is called the axis of the cylinder. But in order to embrace all varieties of cylinders, we must generalize the mode of generation. A C., then, is a solid generated by a line which moves parallel to itself while one end traces upon a plane any curve whatever. When the position of the generating line is at right angles to the plane, the C. is *right;* when not, it is *oblique*. If the curve traced is a circle, and the line perpendicular to the plane, the C. is a *right circular C.*, etc. In all cases, the content of the C. is found by multiplying the number of square units in the base by the number of linear units in the altitude, which is the perpendicular distance between the two ends. The area of the convex surface is equal to a rectangular parallelogram whose base is the circumference of the end, and its height the length of the generating line. To this must be added the areas of the two ends, to get the whole surface of the cylinder.

CYLLE'NE, a mountain in n.w. Arcadia, the fabled birthplace of Mercury. Its modern name is Zyria.

CY'MA (Lat.), in architecture, a molding consisting of a hollow and round conjoined. When hollow in the upper part, it is termed C. recta; when hollow in the lower part, it was called C. reversa.

CYMA'TIUM. See ENTABLATURE.

CYMBALS are military instruments of percussion, which, when struck one against the other, produce a loud harsh sound of no fixed pitch. The best C. are those made in Turkey and China. Attempts to discover and imitate the composition of the metal have all failed. The notes in music for this instrument are all placed on the same line or space, in rhythmical succession. C., although military instruments, are now much used in the orchestra by modern composers.

CYMBELINE, one of the ancient kings of Britain, immortalized by Shakespeare in a play called by this name. His daughter, Imogen, married Posthumus Leonatus. His second wife had, by a former husband, Cloten. It is supposed that Shakespeare borrowed the name from Cunobelinus, found in Holinshed's *Chronicle*. Several coins with his imprint are still extant. See SHAKESPEARE, HOLINSHED.

CYME, in botany, a common form of centrifugal (q.v.) inflorescence, in which the rachis or floral axis disappears by separating into irregular branches, and these are short and corymbose. It is of very general occurrence in the *caryophyllaceæ*. Examples may be seen also in the common elder, different species of *viburnum*, etc. The *verticillasters* of the *labiatæ* are small cymes in the axils of opposite leaves, assuming nearly the appearance of whorls.

CYM'RY. See CELTIC NATIONS,

CYNAN'CHÉ (Gr. *kuōn*, a dog, and *anchō*, I suffocate), a term applied to the severer forms of sore throat. See THROAT, AFFECTIONS OF THE.

CYNAN'CHUM, a genus of plants of the natural order *asclepiadaceæ*, having a wheel-shaped corolla, and a lobed or cleft corona. *C. monspeliacum*—a herbaceous twining plant, with roundish, heart-shaped, stalked leaves, a native of the shores of the Mediter-

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ranean—yields the drug called *Montpellier scammony*, a violent purgative, and not much used. *C. ovalifolium* is a native of Penang, and its sap yields caoutchouc of excellent quality.

CYNAROCEPH'ALÆ. See COMPOSITÆ.

CYNEWULF, a writer of some of the noblest and most finished specimens of old English verse. By some he has been identified with Cynewulf, Bishop of Lindisfarne, in the middle of the 8th century; Grimm speaks of him as a pupil, or at least a contemporary of Aldhelm, but the only positive information concerning him is that contained in his own works. From those we learn that in his youth, which was wild and riotous, he was a scóp, or gleeman, lived possibly in Northumbria, and later, after a troubled life, he wrote long religious poems, for he mentions at the close of one that it was written in his old age. The date of his life varies from the 8th to the 11th century, a late date being more probable. Cynewulf's name was first discovered in 1832 at Vercelli, by Dr. Blume, in an old volume containing Anglo-Saxon sacred poems; among them was the *Elene*, into which, as in the *Last Judgment*, Cynewulf curiously wove his name in runes, thus establishing their authorship. His principal are the *Crist*, a poem of nearly 1700 lines, celebrating the three-fold coming of Christ, in the Incarnation, the Ascent into Heaven, and the Last Judgment; the *Elene*, a legend of the discovery of the true cross by the Empress Helena; *Juliana*, the story of the martyrdom of St. Juliana under Maximian.

CYN'ICS, the name applied to a sect of Greek philosophers, who were distinguished mainly for their morose and snarling ethics. For a knowledge of their peculiar opinions, see articles ANTISTHENES, DIOGENES, MENIPPUS, etc.

CY'NIPS. See GALL-FLY.

CYNOCEPH'ALUS. See BABOON.

CYN'ODON, a genus of grasses, having digitate or racemose spikes, with spikelets on one side, glumes nearly equal, boat-shaped, and containing one floret, which has two awnless paleæ, the fruit coated with the hardened paleæ. The most important species is *C. dactylon*, a grass very widely diffused, being the principal fodder-grass and best pasture-grass of India, where it is the principal covering of many thousands of square miles, and is known by the names of *dhob*, *doorba*, etc., and also common in the s. of Europe. In Britain, it is rare, being found only on the sandy shores of Cornwall. Its creeping roots, and those of its congener, *C. lineare*, have medicinal virtues, and are sometimes used as a substitute for sarsaparilla.

CYNOMO'RIUM, a genus of plants of the curious parasitic natural order *rhizanthea* (q.v.). *C. coccineum*, a plant of a strange fungus-like appearance, is found in the islands of Malta and Gozo, most abundantly on a particular rock in Gozo. It was long known as *fungus melitensis*, and enjoyed the highest reputation as a styptic, besides being used as an astringent in dysentery and other maladies. So high a value was set upon this plant, that the knights of Malta took it under their particular care as one of their choicest possessions; it was carefully gathered and deposited in a government office, from which the grand-master sent it to friendly sovereigns, and to the hospitals of the island. A keeper of the rock which produces the plant is still appointed, and his salary appears in the public accounts of Malta.

CYNOSCEPH'ALÆ, a mountain range in Thessaly, ancient Greece, noted for two important conflicts. In the first the Thebans defeated the tyrant of Pheræ, 364 B.C.; in the second the Romans defeated and captured Philip of Macedon, 196 B.C.

CYN'OSURE (Gr. *kynosoura*, the tail of the dog, *Ursa Minor*, the Little Bear) is the constellation of which the pole star is the principal star. Milton's lines—

> Where perhaps some beauty lies,
> The Cynosure of neighboring eyes.—*Allegro.*—

have made the word popular; the metaphor is grounded on *Ursa Minor* being the constellation towards which the others look, as it were, and round which they wheel.

CYNOSU'RUS. See DOG'S-TAIL GRASS.

CYNTHIAN'A, city and co. seat of Harrison co., Ky., on the Licking river and the Louisville and Nashville railroad, 66 m. s. of Cincinnati; the scene of some fighting during the civil war. It is in a fertile agricultural district, is widely known for its manufacture of Bourbon whisky, and has carriage, plow, and cigar factories, flour-mills, Harrison Female College, Smith classical school, high school, public library, national banks, and several weekly newspapers. Pop. '90, 3016.

CYPERA'CEÆ, or CAREX'NEÆ, sometimes popularly called SEDGES, a natural order of plants, akin to grasses, but having generally a triangular stem, which is without joints, or almost so, and often leafless. The leaves are sometimes sheathing, but their sheaths are always entire, not split, as in the grasses. The flowers, which are hermaphrodite in some, and unisexual in others, consist of a scale-like *glume*, under which lie the organs of fructification, the pistils alone being frequently inclosed in a separate urn-shaped covering; the place of the perianth is sometimes supplied by a few bristles. The stamens are 1 to 12 in number, the anthers erect: the ovary is one-seeded, the style single, trifid or bifid; the fruit a small crustaceous or bony nut, the embryo lenticular, and inclosed within the base of the albumen. Plants of this

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order, which contains fully 2,000 known species, occur in all zones; some of the genera, as *carex* (q.v.), abounding in the colder, some, as *cyperus* (q.v.), in the warmer parts of the world. Many of them are plants of very humble growth, some, as bulrushes, papyrus, etc., comparatively large, but none rival in size the bamboos and other gigantic grasses. Most of them grow in marshy and moist places, but a few in sunny dry places. Their stems and leaves are in general very deficient in succulence, and in most of them, also very rough, so that they are eaten by domesticated cattle only when in a very young state, and rather from necessity than from choice, and are regarded by farmers as mere weeds. See CAREX, CYPERUS, and SCIRPUS. Some of the uses of plants of this order are noticed in the articles BULRUSH, COTTON-GRASS, and PAPYRUS.

CYPE'RUS, a genus of plants of the natural order *cyperaceæ*, distinguished by hermaphrodite flowers and compound spikelets of numerous two-rowed glumes, including no bristles or scales. It contains a great number of species, chiefly tropical, and gradually decreasing in number towards the colder parts of the globe. Only two are found in England, and these are very rare. Many of the species have tubers or corms, which in some are mucilaginous and nutritious; in others, contain also a bitter principle, and possess medicinal qualities. Of the latter class is *C. longus*, or sweet C., one of the species which have been found in England, common in ditches and wet meadows in some parts of Europe, the rhizome of which has an odor of violets, and is astringent, tonic, and stomachic. It has been employed in medicine from very ancient times; but is now more used in perfumery. Some of the Indian species are also used medicinally and in perfumery in their native country, as well as species of kindred genera. Of those with esculent tubers, the most important is *C. esculentus*.

CYPRÆ'A. See COWRY.

CY PRÈS, doctrine of, in English law. As the law forbids the giving of an estate tail to the son of an unborn son of a living person, after a life-estate given to such unborn son, and would regard such estate tail as void, the courts, when such a gift is made in a will, apply the doctrine of C. P., and endeavor, *as near as possible*, to carry out the testator's wish, by giving to the unborn son of the living person an estate tail, instead of for life, and so enabling his son to succeed if the entail be not barred. See ENTAIL. So also, when a charity cannot reasonably be administered precisely as directed by the testator, the court, by the doctrine of C. P., administers it as near as possible to his directions.

CYPRESS, *Cupressus*, a genus of plants of the order *coniferæ*, the species of which are evergreen trees or shrubs, with small generally appressed and imbricated leaves, and with almost globular cones, the scales of which bear numerous hard seeds. The best known species is the COMMON C. (*C. sempervirens*), a native of the Levant, the n. of Africa, and the s. of Europe, and sometimes met with in England It is a tree of no great height, with quadrangular twigs. The leaves are dark green, and the tree has, therefore, a somber aspect, and from very early times has been an emblem of mourning; the Greeks and Romans put its twigs in the coffins of the dead, they used it to indicate the house of mourning, and planted it about burial-grounds, as is still the custom in the east. The wood of the C. is yellow or reddish, and has a pleasant smell. It is very hard, compact, and durable; the ancients reckoned it indestructible; and the resin which it contains gives it the property of resisting for a long time the action of water. It is not liable to the attacks of insects, and was formerly much esteemed for the purposes of the cabinet-maker. Some believe that the C. is the true cedar-wood of Scripture, and it has also been supposed that it is *gopher wood*. Specimens of this wood are in existence in museums, which are known to be several thousands of years old. The doors of St. Peter's at Rome, made of C., lasted from the time of Constantine the great to that of pope Eugene IV., above 1100 years, and were perfectly sound when at last removed, that brazen ones might be substituted. Medicinal virtues were formerly ascribed both to the wood and seeds of the C., and the balsamic exhalations of the tree were reckoned very salutary in diseases of the chest.—Several other species of C. are natives of temperate and warm climates in different parts of the world. There are many known species, and among them are the Portugal C., or cedar of Goa (*C. Lusitanica*), a native of Goa naturalized in Portugal; *C. thurifera*, a native of Mexico, which exudes a resin used in that country for incense; *C. torulosa*, a native of the Himalayas, and which has been grown successfully in Britain; *C. funebris*, lately introduced into Britain from China; the white C., or white cedar of North America (*C. thyoides*); *C. nutkaensis* (*Thujopeis borealis*), the valuable yellow C. of Alaska and Oregon; *C. Lawsoniana* of upper California; and *C. excelsa* from Mexico. See illus., TREES, vol. XIV.

CYP'RIAN, THASCIUS CÆCILIUS, an illustrious father of the African church, was b. in Carthage about the beginning of the 3d century. He belonged to a respectable family, and was a distinguished teacher of rhetoric before his conversion to Christianity, which took place about 246 A.D. His benevolence secured for him a high degree of popularity, and his piety no less veneration, in consequence of which he was made bishop of his native city in less than three years. In 250, he fled into the desert, to avoid the persecution of Decius. Here he remained a whole year, but not in idleness. The same prudence, energy, and activity that he had always displayed, were now shown in that extensive correspondence which he carried on with his clergy on ecclesiastical matters.

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On his return to Carthage in 251, he suppressed, but with moderation, the rising controversy regarding the *lapsed* (q.v.), or Christians who, during the time of trial, had apostatized. C.'s views regarding the proper dignity of the bishop of Rome have frequently been mistaken: he, indeed, recognized the Roman bishop as the successor of Peter, and as the representative of the unity of the church; but he asserted that the pre-eminence of the Roman see was confined to the earliest times, and that, in later times, other bishops, or successors of the apostles, had dignities equal to that of the successors of Peter. He therefore firmly opposed the supremacy asserted by the Roman bishop, Stephanus, in the question of baptism by heretics. In the persecution under Valerian, 257, C. was banished to Curubis; but having returned to Carthage in the following year, he was there beheaded. C. was both a learned and eloquent divine, but he was even more conspicuous for his dignified, moderate, and wise conduct. His knowledge of human nature enabled him to exercise a wide influence over the African church; and his correspondence, from which the best idea of his character is obtained, gives us an interesting picture of the times in which he lived. His writings—less crabbed and rhetorical than those of his teacher, Tertullian—contain, besides 81 *Epistolæ*, or official letters, several important treatises, among which may be mentioned the *De Unitate Ecclesiæ Catholicæ*, the *De Lapsis*, the *De Disciplina et Habitu Virginum*, the *De Gratia Dei*, and the *De Idolorum Vanitate*. The best editions of C.'s complete works are that of Fell, bishop of Oxford (1682), and that of Baluze (Paris, 1726). There are many lives of Cyprian. One of the most recent is by Reinkens (1873).

CYPRIAN, a name sometimes given to a courtesan as being a follower of Venus, the Cyprus-born goddess.

CYPRINE, a name given to one of the varieties of vesuvian (q.v.), probably because first discovered in Cyprus. This metal has a slight blue tinge, due probably to the presence of copper.

CYPRINIDÆ, a family of malacopterous fishes, having a small mouth, the jaws almost toothless, but the pharynx or hinder part of the mouth furnished with teeth; the body generally covered with scales, the gill-rays few, and no adipose fin (like the second dorsal fin of the trout or salmon). The genera and species are numerous. All the C. are fresh-water fishes. They are found in the lakes and rivers of almost all parts of the world. To this family belong the carp, dace, tench, bleak, bream, barbel, minnow, gold fish, roach, loach, etc. Many of the species are much esteemed for the table. The fecundity of the C. is great.

CYPRINODONTIDÆ, a family of malacopterous fishes, allied to *cyprinidæ*, with which they were formerly ranked, but differing from them in having the jaws more protractile and toothed. Some of them are American, some Asiatic; some inhabit fresh, and some salt water. To this order belong some interesting and curious fishes, particularly the anableps (q.v.), remarkable for the conformation of its eyes. The species of the genus *orestias* are found in the lakes of the Andes, at a great elevation above the sea, and are higly esteemed for the table.

CYPRIOTE, an inhabitant of Cyprus (q.v.).

CYPRIPEDIEÆ, a tribe of orchidaceous plants, with 8 principal cultivated genera, remarkable for having 2 fertile anthers; the third, a thick, sterile substance situated between them, representing the single fertile anther in the other tribes; pollen, pulpy or granular. They are natives of the cool and temperate parts of the northern hemispheres, tropical Asia and its islands. In the genus *Cypripedium*, the sepals and petals are spreading; stigma is terminal; pollen viscid; root fibrous; leaves are large and plaited; flowers in the North American species, usually large and single; blooming in spring or early summer in swamps or rich woods. The cypripediums, or lady's-slippers, as they are popularly called, are all terrestrial, and are easily cultivated in hot-houses, or, as in the case of our North American species, in shaded gardens. The nine or ten species found in the United States include the tall showy lady's slipper, (*C. spectabile*), the stemless or pink lady's-slipper, often called moccasin-flower (*C. acaule*), with its rose-purple pouch, the large yellow lady's-slipper (*C. pubescens*), the rare and odd little ram's-head lady's-slipper (*C. arietinum*), the equally rare white lady's-slipper (*C. candidum*), and the small *C. montanum* of the Northwest. *C. acaule*, our most common species, is found both in dry woods under evergreens and in swamps, while *C. spectabile* is limited to peat-bogs or low woods. The roots of *C. pubescens* and *C. parviflorum* are used by herb doctors as sedatives in nervous diseases. The European species, *C. calceolus*, is called in France *Sabot de la Vierge*, the Virgin's Sabot. There is not only great variety in the color of the labellum, or sac of a cypripedium, but the lateral petals of some species, as in *C. barbatum* of our hot-houses, are studded with bristling hairs, or are curiously prolonged until they nearly touch the earth, and the leaves of other species (*C. venustum*, for instance) are beautifully spotted. See LADY'S-SLIPPER.

CYPRIPE'DIUM. See CYPRIPEDIEÆ.

CYPRIS. See VENUS.

CYPRIS, a genus of minute entomostracous crustaceans of the order *branchiopoda* (q.v.), having the body inclosed in a shell of two horny pieces, somewhat resembling that of a bivalve mollusk. The antennæ and feet are beautifully feathered with long fringed bristles, by means of which these animals swim with much vivacity.

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CYPRUS, one of the largest islands in the Mediterranean, in the extreme northeast of that sea, nearly equidistant from Asia Minor on the n. and Syria on the e.; 46 m. from the former, and about 50 m. from the latter; 145 m. long and 60 wide at the extreme points: 3580 sq. m.; pop. '91, 209,286—said to have been 1,000,000 when under the rule of Venice. By treaty between the British government and the Ottoman empire, June 4, 1878, Asiatic Turkey was placed under British protection, with the stipulation that if Russia should restore to Turkey the conquests made in Armenia during the late war, Cyprus should be evacuated by England and the convention be at an end. Sir Garnet Wolseley was appointed governor, and was installed as administrator, July 23. The island was formally taken possession of in the name of the queen by vice-admiral lord John Hay, July 12, 1878. Sir Walter Joseph Sendall was appointed high commissioner in 1892. A great part of the island is occupied by mountain ranges in a general direction of w. to east. One of the most lofty, and which fills the whole s. portion of the island, is generally called by modern geographers Mt. Olympus, but the ancients applied that name to only one particular peak. The highest summit so far as known is that of Mt. Troödos, 6,590 feet. The s. range terminates in the isolated peak of Oros Stavro, or hill of the Holy Cross, a conspicuous object from Larnaka, and evidently the one called Olympus by Strabo, although it is but 2,300 ft. high. The n. range is an unbroken ridge for 100 m., inferior in elevation to the other, its highest summits not exceeding 3,200 feet. Between these ranges is a broad plain extending across the island from the bay of Famagosta to that of Morphu on the w., about 60 m. long and from 10 to 20 m. wide. This plain is called the Messaria, and is watered by two streams. It is for the most part open and uncultivated, presenting nothing but barren downs, but corn is grown in some places, and the whole valley is doubtless susceptible of cultivation. The plain is bare of timber, and only the loftiest and central summits of Mt. Olympus retain their covering of pine woods. The climate varies in different localities; in the central plain and about Larnaka the heat is excessive, but is tempered by cool seabreezes until about the middle of Sept., between which time and the end of Oct. is the hottest period. The winter is short and cold, but snow is seldom seen except upon high mountain peaks. Fevers are prevalent during the warm months.

Drainage and the planting of trees would do much to benefit the least healthy regions. Agriculture and manufactures are both in a backward state, the Greek Christians, who constitute three fourths of the population, having grown indolent and spiritless under Turkish domination. There has been some progress, however. In 1871 Nicosia was brought into telegraphic communication with the rest of the world by means of a submarine cable to Latakia on the Syrian coast, and this line was subsequently extended to Larnaka, and there is communication by cable with Alexandria in Egypt. There are several hundred miles of telegraph lines and good roads. In 1895, besides two or three high schools, there were 215 Christian schools, and about 100 Moslem schools. Nine newspapers were published, seven of them in the Greek language. The people are quarrelsome, and there is a large amount of crime, but pauperism is almost unknown. In all the courts, except the supreme court, native (Christian and Mohammedan) judges take part. There is no public debt, but a sum of about $464,000 is payable annually to the Sublime Porte, under the convention of 1878. The Imperial Ottoman bank and the Anglo-Egyptian bank have establishments on the island. Turkish weights and measures are current, and English, French, and Turkish coins. Among the chief exports are raisins, cocoons, wines, wheat and barley, wool, carobs and flour; the chief imports are cotton and woolen manufactures, tobacco, groceries, rice, alcohol, iron, leather, petroleum, timber, sugar, soap, and copper manufactures. The value of imports in 1895 was £276,318; of exports £308,716, and the tonnage of vessels entering and clearing was 598,295. The sponge fisheries yield sponges valued at between $100,000 and $150,000 per annum.

In ancient times this island supplied the Greek monarchs of Egypt with timber for their fleets. It was also celebrated for its mineral wealth, especially for copper, a metal which takes its name (cuprium) from the name of the island. No copper mines are now worked. There was also considerable silver produced, and Pliny says the precious stones were found there. Salt, for which the island was noted in old times is still produced in large quantities in the neighborhood of Larnaka and Limasol. Gypsum and terra umbra are the chief minerals found. The principal vegetable productions are cotton, wines, and fruits; some tobacco is grown. Cultivation is easy and the soil in many places is exceedingly productive, particularly at the foot of Mt. Olympus, and along the level land of the n. shore. The want of good harbors is greatly felt. The chief places of trade, Larnaka, and Limasol, have only roadsteads; and Salamis, which was the chief port of antiquity, as well as Famagosta, which held that position under the Venetians, were only artificial harbors on an open sandy coast. The English early selected Famagosta as the most favorable place to construct a good harbor. The towns in Cyprus worthy of notice are: 1. Lefkosia, commonly called Nicosia, which since the time of the Lusignan kings has been the capital of the island; 2. Famagosta, on the e. coast near the ruins of Salamis, which was the chief port under the Venetians, and famous for the defense against the Turks in 1571, now having only a few hundred inhabitants; 3. Larnaka, on the s.e. coast on the seat of the ancient Citium, now the chief place of trade, with 7000 or 8000 inhabitants; 4. Limasol, on the s. coast, some distance w. of the site of Amathus, the chief point for the export of wines; 5. Baffo, or Papho, on the site of the ancient Paphos, on the s.w. angle of the island.

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The early history of this famous island is imperfectly known. It was certainly colonized at a remote period by the neighboring Phenicians, who established the worship of Ashtaroth (called by the Greeks Astarte, and by them identified with their own Aphrodite), for which worship—better known as that of Venus, to whom a temple was built—the island was long celebrated. The Greeks settled there soon after the Phenician colonization; and it is probable that the former soon obtained political supremacy, while the latter held influence over the manners and customs, arts, and religious rites, which were wholly different from those in Crete, Rhodes, or other Ægean islands. The first known fact in the history of Cyprus, is its conquest by the Egyptian king Amasis in the 6th c. B.C. In 525 B.C., however, there was a revolt against Egyptian and an acceptance of Persian rule, the island thenceforth becoming a tributary province of the Persian empire. As a proof of the island's great prosperity about this time, it is noted that Cyprus contributed not less than 150 ships to the Persian fleet under Xerxes. Evagoras, king of Salamis, succeeded in extending his authority over a great part of the island, 387 B.C., and became independent of Persia, but under his son the Persian rule was again enforced. After the battle of Issus, when Alexander advanced in Phœnicia, all the cities of Cyprus declared in his favor, and sent ships to assist him in the siege of Tyre. During this period, though the island was subject to Persia, the several cities enjoyed the privilege of local self-government. Their institutions, however, presented one marked difference from those of other Greek cities. They were governed by kings, of whom there were not less than nine in the island. The cities which were the seats of those petty monarchies were: Salamis, Citium, Amathus, Curium, Paphos, Marium, Soli, Kerynea, and Lapathus. Idalium and Golgos, names celebrated in the history of the worship of Venus, appear to have been merely *sanctiones* or holy places. After the death of Alexander, the possession of this island, so important for its seemingly inexhaustible forests (it is now quite bare of trees), became an object of contention among his successors. After varying fortunes, it passed into the hands of Ptolemy of Egypt. But in 306 B.C. a great effort to recover it was made by Demetrius, son of Antigonus, who reduced the whole island and laid siege to the city of Salamis. The effort of Ptolemy, who came with a great fleet to raise the siege, gave rise to one of the most memorable naval battles of antiquity, in which the Egyptians were utterly defeated, and Salamis, with all the island, passed into the power of Demetrius. But Ptolemy recovered the island in 295 B.C., and thenceforth it continued to be one of the most valuable possessions of Egypt. More than once this island decided the sovereignty of the Nile kingdom. Finally, the aggressive Romans fixed their eyes on Cyprus; the tribune Clodius proposed its seizure in violation of all right or decency; and Cato was the reluctant instrument for consummating the outrage. About half a century before the beginning of the Christian era, there ensued a period of stagnation in which little is heard of the island. Cyprus is noticed in Acts iv., 36, where it is mentioned as the native place of Barnabas; and in Acts xi., 19–20, it appears prominently in connection with the earliest spreading of Christianity. When Paul was sent with Barnabas from Antioch on his first missionary journey, this island was the scene of their first labors. The most remarkable event in the history of Cyprus while it was under the Roman empire was a great revolt of Jews, who had established themselves there in large numbers, in which revolt the Jews, 117 A.D., are said to have destroyed not less than 240,000 of the other inhabitants. After the division of the Roman empire, Cyprus passed under the Byzantine emperors. In 646 the Arabs became masters and destroyed the city of Salamis. Two years later, the Greeks recovered sway; but in 802, it was again conquered by Haoun-el-Raschid, who was soon compelled to relinquish it to the Byzantine rulers. In 1184, Isaac Comnenus made Cyprus an independent sovereignty. In 1195, Richard of England ejected Comnenus and put Guy de Lusignan in possession as compensation for the loss of Jerusalem, of which Guy had been appointed king. For three centuries, Cyprus had a succession of petty kings, who introduced the feudal system and other European institutions. After many attempts to secure control, the Venetian republic came into full possession of the island in 1487, and held the rule for about 80 years. In 1570, Selim II., sultan of Turkey, invaded Cyprus with 60,000 men, quickly subdued the country districts, took the capital (Nicosia) after a siege, and murdered 20,000 of its inhabitants. Famagosta held out for a year and then made a capitulation, which was of course immediately violated by the Moslem butchers, who slowly tortured to death the governor of the city. From that period, Cyprus has been a part of the Turkish empire. Two events only have disturbed the stagnation of that blighting rule; an insurrection in 1764, which was quickly suppressed, and a massacre of the Greek population in 1823. Under the Koran and the Crescent an island that should be the most enterprising, prosperous, and productive in all the east, is one of the most impoverished and worthless. See ARCHÆOLOGY.

CYP'SELUS. See SWIFT.

CYR, ST., the name of several places in France, the most important of which is St. C., in the department of Seine-et-Oise, about 3 m. w. of Versailles. Population, 1695 The village owes its origin to an educational institution for the daughters of nobles of fourth descent on the father's side, founded here in 1686 by Louis XIV., on the suggestion of Madame de Maintenon. There were about 250 pupils, for whom Racine

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wrote his tragedies of *Esther* and *Athalie*. Madame de Maintenon died here, and was buried in the choir of the church. The institution was suppressed at the revolution. The buildings were at first converted into a military hospital, and in 1803 into a military school by Napoleon for the education of some 300 officers, about 140 of whom leave annually.

CYRENA'ICA, the name of the district whose capital was Cyrene (q.v.). At one period, it nominally stretched from Carthage to Egypt, and extended inland as far s. as the oasis of Fezzan; but a great portion of this territory was occupied by the subject Libyan tribes, and not by the Greek colonists, who were confined chiefly to the plateau of Baca, with the subjacent coast. This portion of C. was, and still is, one of the loveliest and most agreeable regions of the world. The climate is delicious, mountains on the s. sheltering the land from the scorching blasts of the Sahara, and cool sea-winds fanning it on the north. From the central plateau, whose breadth is about 80 m., the land slopes down in verdent terraces to the Mediterranean. These terraces are cut and watered by mountain streams, forming luxuriant ravines. The productions of C. mentioned by ancient writers are corn, oil, wine, honey, fruits of all kinds, cucumbers, truffles, cabbage; flowers yielding the richest perfumes; and a rare plant called *silphium* (still abundant), from which was obtained the gum-resin, greatly esteemed for medicinal purposes. The country was also celebrated for its breed of horses, but was much exposed to the ravages of locusts.

The chief cities of C. were Cyrene, Teucheira (afterwards called Arsinoë), Hesperides (afterwards called Berenice), Barca, and Apollonia. To each of these five cities (whence in the time of the Ptolemies C. was named Pentapolis and Pentapolitan Regia) a certain amount of territory was attached. This favored their individual independence; and the consequence was that the dynasty of Battus, who led the first Greek colony to Cyrene (q.v.), exercised very little influence over C. in general. After passing into the hands of the Egyptians and Romans, C. became a portion of the Byzantine empire. In 616 A.D., it was conquered by the Persian Chosroes, and in 647 was overrun by the Arabs. Ancient C. nearly corresponds with modern Barca (q.v.)

CYRENA'ICS, a sect of philosophers founded by Aristippus of Cyrenaica, a pupil of Socrates, about 380 B.C. Their theory was that moderate and reasonable enjoyment was the great object as well as the best method of life. A century later Epicurus elaborated the same idea.

CYRENA'IC SCHOOL. See ARISTIPPUS.

CYRENÉ', the capital of Cyrenaica (q.v.), was founded 631 B.C., by a colony of Spartans under Battus, who dynasty lasted for nearly two centuries. During this period, it made rapid advances. On the death of Arcesilaus IV., the last of the Battidæ, about 450 B.C., a republic was established, but the political condition of the city under the new government was far from prosperous. Party contests raged, until at last it fell into the hands of the Romans. During its prosperity, C. carried on a great commerce with Greece and Egypt, and to a less extent with Carthage. Its extensive ruins still attest its former magnificence. C. was the birthplace of the philosophers Aristippus, Anniceris, and Carneades, the poet Callimachus, the astronomer Eratosthenes, and the rhetorician Synesius, who afterwards became bishop of Apollonia.

CYRE'NIUS, PUBLIUS SULPICIUS, a Roman proconsul (governor) of Syria at the time of the birth of Christ. He seems to have had two official terms—from 4 to 1 B.C., and from 6 to 11 A.D.

CYRIL, a professor in the ancient law college of Berytus, and one of the founders of the œcumenical school of jurists, opening the way for Justinian's legislation. He is called the great Cyril in distinction from C., a jurist who lived after Justinian. C. wrote a treatise on definitions, in which, according to a statement of his contemporary Patricius, the subject of contracts was treated with superior precision and great method.

CYRIL, SAINT, bishop of Alexandria, was one of the most energetic but least amiable of the church fathers. The date of his birth is not known. He was educated by the fanatical monks of Nitria, with whom he lived for five years, and who probably inspired him with that fiery, intolerant, and ignorant zeal which characterized him through life. Subsequently, he went to Alexandria, where he became a presbyter, and on the death of his uncle, Theophilus, 412 A.D., obtained the episcopal see. The Alexandrian Jews, who were numerous and wealthy, were the first to feel the fierceness of his religious hate. Some Christian blood having been shed by them in a city tumult, C. put himself at the head of a rabble of zealots, attacked the Jewish quarter of Alexandria, destroyed the houses, and banished the inhabitants. Orestes, the prefect of Egypt, having drawn up an accusation against C., was attacked in the streets by 500 monks, who had come up from the deserts of Nitria, at the call of their old companion, eager for the work of destruction. One of these monks having fallen in the skirmish, his corpse was carried in procession to the high church of Alexandria, where C. delivered a sanguinary discourse, gave the dead monk the name of *Thaumasius*, and pronounced him a martyr and a saint. But perhaps the most barbarous deed with which this persecutor of heretics and heathens had to do, was the murder of the heathen maiden Hypatia (q. v.), the daughter of the mathematician Theon. Theodoret gravely accuses him of

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instigating the Alexandrian populace to this horrid act. But the most important historic event in his career was his controversy with Nestorius (q. v.). All the worst features of his disposition appeared in this broil. Even the gentle Neander overflows with pious wrath, and pursues C. through 60 pages of his *Church History* with the fiercest epithets. In the midst of unquietudes, which he himself had largely occasioned, he died 444 A.D. C.'s numerous writings consist of commentaries, treatises, homilies, epistles, etc. The best edition was published by Aubert (7 vols., Paris, 1638). See Neander's *Kirchengeschichte*, transl. by Bohn, vol. iv. pp. 133–196.

CY'RIL, SAINT, bishop of Jerusalem, an eminent church father, was b. at Jerusalem about 315 A.D., and ordained a deacon in 334, a presbyter in 345, and on the death of Maximus in 351, was elected bishop of his native city. His metropolitan was the Arian bishop, Acacius of Cæsarea, with whom he was soon engaged in hot conflict concerning originally the rights of his office, but ultimately their differences of doctrine. Acacius accused C., before a council hastily "got up" at Cæsarea in 358, of selling the treasures of his church in a time of famine to feed the poor! Strange to say, C. was deposed for doing this praiseworthy action. He now appealed to a larger synod, which was held at Seleuceia. This synod restored him to his office; but once more, through the persevering hostility of Acacius, he was deposed by a council assembled at Constantinople in 360. On the death of the emperor Constantius, he was again restored to his episcopate in 362. Soon after, his old enemy Acacius died, but C. was immediately involved in new difficulties. After considerable strife, C. was banished, by order of the emperor Valens, in 367; nor did he return till the emperor's death in 378. He died in 386.

C.'s writings are extremely valuable, not on account of their vigor, profundity, or beauty, but on account of their theology. They consist of 23 treatises, 18 of which are addressed to catechumens, and 5 to the newly baptized. The former are for the most part *doctrinal*, and present to us in a more complete and systematic manner than the writings of any other father the creed of the church; the latter are *ritual*, and give us a minute account of baptism, chrism, and the Lord's supper. Their style is simple and unattractive. The best edition of C.'s works is that published by Touttée, the Benedictine monk (Par. 1720).

CYRIL, the apostle of the Slaves (in the 9th c.), sprang from a respectable family living in the half-Slavic, half-Greek town of Thessalonica. On account of his knowledge, he obtained the surname of the philosopher. Having been consecrated a priest, he went forth, during the reign of the Byzantine emperor, Michael III., to evangelize the Chasars, who dwelt by the Caspian sea. His labors were very successful, the khan himself being among his converts. Boris, the heathen prince of Bulgaria, having about this time besought the patriarch of Constantinople to send him a preacher of the gospel, C., along with his brother Method, was selected. Their labors were not in vain. Boris was baptized in 860. Rastic, prince of Moravia, next invited them to his country. They accepted the invitation, and while there, assisted by a number of their own pupils, completed their translation of the Holy Scriptures, which is in use to the present day, as a sacred or church language, among all Greek-Catholic Christians (Russians, Bulgarians, and Serbs). From Moravia, Christianity, according to the Slavic ritual, spread into Bohemia, whose prince, Boriwoj, and his spouse, Ludmilla, were baptized by Cyril. C. died in 869. The *Apologi Morales*, ascribed to C., were published by Corter (Vienna, 1630). See Richter's *Cyril and Method* (Olmütz, 1825).

CYRILLA, evergreen trees and shrubs, of which some varieties are found in the southern United States. Under cultivation, some of these varieties are exceedingly ornamental.

CYRILLIC ALPHABET, a method of writing invented about 863 A.D. by St. Cyril. This, with certain modifications, is the alphabet now used in Russia.

CYRUS, a river in Asia. See KURA.

CY'RUS, the founder of the Persian monarchy, commonly called C. THE ELDER, was, according to Herodotus, the son of Cambyses, a Persian noble, and of Mandane, daughter of Astyages, the Medo-Persian king. His birth was a source of alarm to his grandfather Astyages, who had previously had a dream, the interpretation of which portended that the offspring of Mandane would one day be the ruin of the Median supremacy and the ruler of all Asia. He therefore contrived to get the infant into his own hands, and gave it to Harpagus, his chief servant, with orders to put it to death. Harpagus promised to do so, but intrusted it privily to the care of a herdsman, who brought it up along with his own children. The young C. quickly distinguished himself among the country lads by his superior daring and dignity. On one occasion he was elected king in some boyish game by his companions, and in the exercise of his regal authority, caused a nobleman's son to be severely scourged. The father complained to Astyages, who caused the culprit to be brought before him, and recognizing in his person and mien his own grandson, sent C. back to Persia—the magi having in some way satisfied him that his dream had already received its fulfillment. C. himself, however, did not think so, and as he grew up to manhood, began to meditate ambitious schemes. All writers testify to his courage, amiability, and address. He was exactly the kind of man to gather round him brave, venturesome, loyal followers. The tyranny of Astyages had made him hate

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ful to his subjects, and by the help of the crafty Harpagus, C. soon formed a party among the Medes favorable to his designs. Putting himself at the head of his Persian troops, C. advanced into Media, and overthrew the forces of Astyages (559 B.C.). After consolidating his new dominions, which seems to have cost him many years' labor, he proceeded in his career of conquest. The kingdom of Lydia first yielded (546 B.C.), and its king, the famous Crœsus, fell into his hands. Ultimately, the whole of Asia Minor was subdued. But the crowning triumph of C. was his capture of the city of Babylon, the metropolis of Assyria (538 B.C.), whose king was Labynetus, the Belshazzar of Daniel. Through the instrumentality of C., the Jews were delivered from their captivity, and allowed to return to Palestine. His vast ambition, however, proved his ruin. He wished his power to overshadow all Asia, in harmony with the dream of his grandfather; and although his dominions already extended from the Hellespont almost to the Indus, he resolved to subjugate the Scythian peoples, and began an unjust war with the Massagetæ, a nation or tribe who dwelt to the n.e. of the Caspian, beyond the Araxes, whose queen was called Tomyris. At first C. was successful, but in a second engagement he was defeated and slain (529 B.C.).

Such is the account given by Herodotus, and although we are unable to affirm that it rests on absolutely historical ground, it is unquestionably to be preferred to any other. The work of Xenophon, entitled the *Cyropædeia*, is not a history; it is a historical romance, and was manifestly intended by the author for such. Xenophon wished to picture a great and wise king, and finding the elements both of greatness and wisdom in C., he took advantage of his historic personality, and engrafted upon it whatever, according to his own notion, would ennoble and dignify it.

CYRUS, THE YOUNGER, the second of the sons of Darius Nothus, or Ochus, lived about 130 years after the great Cyrus. He conspired against his brother Artaxerxes Mnemon, who had succeeded to the throne (404 B.C.). The plot, however, being discovered, he was at first sentenced to death, but afterwards pardoned, and even restored to his dignity as satrap of Asia Minor. Here he employed himself in making arrangements for war against his brother, although he concealed his purposes to the very last. In the spring of 401 B.C., he left Sardis at the head of 100,000 Asiatics, and 13,000 Greek mercenaries, under pretence of chastising the robbers of Pisidia. Artaxerxes being warned of C.'s perfidy, made preparations to oppose him, and the two armies encountered each other in the plains of Cunaxa, 500 stadia from Babylon. C. was defeated and slain, although the Greeks fought with the greatest courage, and even routed that portion of Artaxerxes' troops immediately opposed to them. The fortunes of the Greeks, on their retreat through the highlands of Armenia, in severe winter weather, are recorded by Xenophon in his *Anabasis* (q.v.).

CYST (*kystis*, a bladder), a word sometimes used in the original sense as applied to hollow organs with thin walls, as the urinary bladder and gall bladder; but commonly reserved for the designation of pathological structures or new formations within the body, having the bladder form. Cysts are commonly transparent, and often almost structureless in their tenuity; they are commonly, however, lined by an epithelium (q.v.), and have membranous walls, with faint indications of fibrous structure. They are either simple or compound, unilocular or multilocular; they are sometimes small, numerous, and separate; in other cases, they grow to an enormous size, and are very complex. Some cysts are distinctly parasitic, and of independent animal nature; such are hydatids (q.v.) and the cystic entozoa (q.v.) generally. Others are probably formed out of the structures in which they arise, their true pathology being, however, obscure. Such are the cysts of the kidney, and still more distinctly, the immense complex cystic structures which form in the ovary. See OVARIES.

CYSTICER'CUS (Gr. bladder-tail), according to many naturalists, a genus of cystic worms (q.v.), characterized by a dilated cyst with a single head, which has four suckers and a circlet of hooks. This genus has, however, latterly been displaced from the system of nature by the discovery that the forms referred to it are only the young of tape-worms. This discovery has been confirmed by a multitude of observations and experiments with regard particularly to *C. cellulosæ*, found in human beings, and in many rodent and pachydermatous animals—as rabbits, pigs, etc.—the young of the common tape-worm; and *C. tenuicollis*, found more rarely in human beings, but often in the abdominal cavity of ruminant quadrupeds, and of pigs, horses, and many other animals—the young of a tape-worm of the dog. *C. cellulosæ* often exists in great numbers in the flesh of pigs, causing the diseased appearance known as *measly*. See CESTOID WORMS. It sometimes occurs in like manner infesting the human body, in muscles of most various parts; it has been found even in the heart, in the brain, and in the eye. That in such cases it sometimes causes death, is too certain, and its removal is not easy, except when it is so situated that it can be reached by the knife, nor is there any sure indication by which its presence in many situations can be known; but it appears also that it may die and be absorbed without causing any very serious consequences to the person in whom it has dwelt. The cysts of this species are always of small size; those of *C. tenuicollis*, however, which generally occurs in the liver, or in other abdominal organs, sometimes become, in some of the lower animals.

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as large as a child's head. Injurious consequences are produced by them when either numerous or very large.—See Cobbold's *Entozoa*.

CYSTIC WORMS, an order of *entozoa*, or intestinal worms, according to the system of Zeder and Rudolphi, for some time generally received by naturalists, characterized by the body ending in a transparent cyst or bladder filled with pellucid fluid, this body having sometimes only one head, as in *cysticercus*, sometimes many, as in *cœnurus*. It has, however, been found that certain species, as *cysticercus cellulosæ* and *cœnurus cerebralis*, are the young of cestoid worms, and it is therefore concluded as highly probable, that all the C. W. are of the same nature, more particularly as all present the appearance of immaturity, in the want of visible organs of reproduction. Until a comparatively recent date, the animal nature of C. W. was not recognized, nor is it long since their relation to tape-worms and other cestoid worms has been fully ascertained. See Cestoid Worms; Cysticercus; Entozoa; Hydatids; Tape-Worm.

CYS'TIN, or Cys'tic Oxide, forms a rare variety of calculus (q.v.). It contains $C_3H_7NO_2S$, has a crystalline texture, a brownish-yellow color, and is semi-transparent. It is not soluble in water, alcohol, or ether, but dissolves in the strong acids.

CYSTI'TIS. Inflammation of the urinary bladder (q.v.).

CYTHE'RA. See Cerigo.

CYTHERIA. See Venus.

CYT'ISUS, a genus of plants of the natural order *leguminosæ*, suborder *papilionaceæ*, of which some of the species, having long twiggy branches, are popularly called broom (q.v.), others are called laburnum (q.v.), whilst others still are generally known by the name cytisus. The characters of the genus are stated in the article Broom. The species are numerous—small trees or shrubs, with leaves of three leaflets, and yellow, white, or purple flowers, natives chiefly of the warmer temperate parts of the old world. Many of them are very beautiful, and some are among the esteemed ornaments of our shrubberies, others of our green-houses.

CY'TOBLAST. See Cells.

CYZ'ICUS, a peninsula of Anatolia, Asia Minor, projecting into the sea of Marmora. It lies to the s.e. of the island of Marmora, and about 70 m. s.w. of Constantinople. It was at one time an island, but the gradual formation of an isthmus connected it with the mainland. Its length from s. to n. is about nine miles, and its breadth from e. to w. 18 miles. In early times, C. was a Milesian colony, and the city of C., upon whose site vineyards and orchards now flourish, is described by Strabo as one of the first cities in Asia, alike for extent and splendor.

CZACKI, Tadeusz, an eminent Polish author, was born in 1765, at Poryck, in Volhynia. At the age of 20, he obtained an office in the supreme justiciary court at Warsaw, and was also made director of the crown archives—a situation which enabled him to gratify his taste for Polish history. Some essays on Polish finance induced the diet to select him, in 1788, as a member of the commission of inquiry into the state of the revenue. His efforts to animate the industry and extend the commerce of his native country were most praiseworthy. A valuable result of his travels through Poland for this purpose is a map of its river-system. He also interested himself greatly in the navigation of the Dniester. At the second partition of Poland, he lost his property, but it was afterwards restored. The chief labor of his life, however, was in connection with the education of his countrymen. His endeavors to instruct the people in the old Polish provinces of Russia, where education had been almost wholly neglected, met the approval of the emperor Alexander. The most important of C.'s educational institutions was the gymnasium at Krzemieniec. In 1807, he was appointed the deputy of prince Czartoryski, who had the care of public instruction in the Polish government of w. Russia. C. died at Dubno, 8th Feb., 1813. His writings prove the comprehensive character of his attainments. His most valuable work is upon Lithuanian law (*O Litewskich i Polskich Prawach*, 2 vols., War. 1800).

CZAR, more properly *Tsar*, is a title of the Russian emperor. The word is derived from the old Slavonic language, and signifies much the same as Ger. *Kaiser*, Lat. *Cæsar*, to which it probably owes its origin; although some etymologists identify it with the termination of the names of the old Assyrian kings—such as Phalassar, Nabonassar, and Nabopolassar. After the 12th c., we find the Russian annalists giving the title of C. to the grand duke Wladimir, Monomach (died 1125), and to several of his successors In general, however, the rulers of the various Russian provinces were called grand dukes till the 16th century. Thus, we have the grand dukes of Wladimir, Kiew, Moscow, etc. The grand duke Wassilij Iwanowitch first assumed, in the year 1505, the title of *Samodershez*, which signifies autocrat. The son of Wassilij, Iwan II., Wassilijewitch the Cruel, caused himself to be solemnly crowned C., 16th Jan., 1547. From this time, the Russian monarchs called themselves czars of Moscow; and after the conquest of Little Russia and Smolensk, czars of all the Russias. The word now became practically the equivalent of emperor; yet Peter I., in 1724, thought fit to assume this latter title in addition; and as the Russian language had no term corresponding to it besides C., the Latin word *Imperator* was introduced, while the empress was termed *Impera-*

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triza. At first, several European powers refused to sanction the assumption of imperial dignity by the Russian C., but ultimately consented to do so. The wife of the C. was named czariza (czarina); the sons, czarewitch; the daughters, czarewna; but after the death of Alexei—Peter I.'s son—these titles were abolished, and the imperial princes called grand dukes, and the imperial princesses grand duchesses. In 1799, the emperor Paul I. introduced the title of cesarewitch (not czarewitch) for his second son, the grand duke Constantine. The heir-apparent and his wife are still called cesarevitch and cesarevna. Among the Russian people themselves, the emperor is more frequently called gossudar (hospodar, i.e., lord) than czar.

CZARTORYS'KI, the name of a Polish family of ancient lineage. MICHEL FRYDORYK, 1695–1775, was chancellor of Lithuania in 1752. His brother, AUGUST ALEXANDER, was the palatine of Red Russia, and accumulated great wealth. His son, ADAM KAZIMIERZ, was president of the diet which elected Poniatowski king. His wife was distinguished for beauty and poetic genius. Another member of the family, ADAM JERZY, 1770–1861, was prominent in the futile attempts at revolution in Poland.

CZARTORYS'KI, ADAM GEORGE, son of prince Adam Casimir C., of an ancient Polish house, sometimes (but wrongly) said to be sprung from the Jagellons (q.v.), was b. at Warsaw, 14th Jan., 1770. Having completed an excellent education at Edinburgh and London, he returned to his native country, and took part against Russia in the war occurring on the second partition of Poland. On the defeat of the Poles, C. was taken to St. Petersburg as a hostage, and here he exhibited so much ability and prudence as to gain the friendship of the grand duke Alexander, to whom he was attached, and the confidence of the emperor Paul, who made him ambassador to Sardinia. When Alexander ascended the throne, he appointed C. assistant to the minister of foreign affairs; and he took an active part in official life until after the peace of Tilsit. As curator of the university of Wilna, to which he was nominated in 1803 by Russia, he exerted all his influence to keep alive a spirit of nationality; and when some of the students were arrested on a charge of sedition, and sent to Siberia, C. resigned his office. His successor reported to the emperor, that the amalgamation of Russia and Lithuania had been delayed a century by C.'s occupancy of the curatorship. Russian favors could not deaden or even dull C.'s pure patriotism. Into the revolution of 1830 he threw himself with all his heart. He was elected president of a provisional government, and in this capacity summoned a national diet, which met, and in Jan., 1831, declared the Polish throne vacant, and elected C. head of the national government. He immediately devoted half of his large estates to the public service, and adopted energetic measures to meet the power of Russia, but in vain; the Poles were crushed, and C.—specially excluded from the general amnesty, and his estates in Poland confiscated—escaped to Paris, where he afterwards resided, the liberal friend of his poor expatriated countrymen, and the center of their hope of a revived nationality. In 1848, he liberated all his serfs in Galicia, and during the Crimean war he ineffectually endeavored to induce the allies to identify the cause of Poland with that of Turkey. He died July, 1861.

CZAS'LAU, a t. of Bohemia, 45 m. e.s.e. of Prague. Its deanery-church, in which the celebrated blind Hussite leader, Gen Ziska, was buried, is surmounted by the highest steeple in Bohemia. C. is also noted as the scene of an important victory gained over the Austrians by Frederick the great, 17th May, 1742. Pop. '90, 8400. Here there are copper works, manufactures of chicory and beet-root sugar, and a distillery.

CZECHS, the most westerly branch of the great Slavic family of nations. About 451–95 A.D., the C. migrated from their lands in Carpathia, on the Upper Vistula, and came into the country now known as Bohemia. According to tradition, their chieftain was named Czech. Georgsberg, near Raudnitz, on the Elbe, is said to have been the first place chosen by the C. for their encampment. Other Slavic tribes migrated into Bohemia; but in the course of time the C. gained such an ascendency that, in the 9th c., the name C. was commonly applied to the whole Slavic population of Bohemia (q.v.). Here, in Moravia, and in other parts of Austria, the C. now number in all above 7,000,000.

CZE'GLED, a market t. of Hungary, 40 m. s.e. of Pesth. It has some handsome buildings and large breweries. The inhabitants (1890), 27,548 in number, are employed principally in agricultural pursuits, the district around yielding much grain and red wine.

CZENSTOCHAU, or CZENSTOCHOWA, a monastery of the order of St. Paul the Hermit, in the Polish government of Kalisch. It is the most frequented place of pilgrimage in the whole country, and is celebrated throughout all the Slavic nations. It occupies a commanding position on the Warthe, not far from the Silesian frontier, and possesses the famous dark-colored picture of the mother of Christ, which has given occasion to the worship of the Black Virgin by all the Polish Catholics. This picture is probably of Byzantine origin. According to the legion in connection with it, it was painted by Luke himself; passed into the hands of the princess Helena; subsequently found its way through a Russian prince, Laon, to Belz in Galicia; and finally, through Wadyslaw, duke of Oppeln, who built the monastery of C., was brought thither to assist him against the Tartars. In more recent times, C. is noted as being the only place in

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Poland which offered resistance to the army of Charles Gustavus, king of Sweden, on which occasion (1655 A. D.) the inmates, comprising 70 monks and 150 soldiers, withstood a siege of 38 days carried on by a Swedish force of 10,000 men. At a later period, however, C. lost its importance as a military position. At the foot of the eminence on which the monastery stands, lie two little towns, Old and New C., which carry on a considerable trade in holy pictures and amulets.

CZERMAK, JAROSLAV, Bohemian painter, 1831–78, brother of J. N. Czermak. The subjects of his best known works have to do with life in Herzegovina and Montenegro.

CZER'MAK, JOHANN NEPOMUK, 1828–73; a Bohemian physiologist, the introducer of laryngoscopy and rhinoscopy into medical practice.

CZER'NOWITZ, capital of Bukowina, in Austria, situated on a hill near the right bank of the Pruth, about 140 m. s.e. of Lemberg. It is the seat of a Greek archbishop; and in 1875 a university was founded here. It has manufactures of machinery, paper, etc. Pop. '88, 53,000; '90, 54,171.

CZER'NY, GEORG; properly, *Karadjordje*, i.e., Black George; the leader of the Servians in their struggles for independence; was b. in 1766, in the neighborhood of Belgrade. He showed, when young, his hatred of the oppressors of his country by murdering a Moslem. After spending some time in Austria, he returned to his paternal estate. In Aug., 1801, a band of janizaries broke into his dwelling, and plundered it. C. fled, vowing vengeance. He soon collected a band of malcontents, and commenced a sort of guerrilla war. Gradually his numbers increased, and in 1804 he captured the fortress of Schabaz. Subsequently, he invested Belgrade, and in the beginning of 1806 routed the Turks at the rivers Drina and Morawa. Assisted secretly by Russia, he captured Belgrade in Dec., 1806. After the treaty of Slobosje (8th July, 1808), he was elected governor by the people, and recognized as prince of Servia by the sultan. The French invasion of Russia in 1812 compelled the latter country to let Servia shift for itself. Hostilities recommenced; the Turks were successful, and C. had to flee to Russia. He afterwards went to Austria, where he lived for some time. Meanwhile, the freedom of Servia had been secured through the leadership of Milosch Obrenowicz; and in July, 1817, C. returned, intending, as some suppose, to rally his partisans round him for the furtherance of his ambitious schemes, when he was murdered at the instigation of prince Milosch.

CZERNY, KARL, 1791–1857; a German composer who wrote a vast number of pieces. Liszt was one of his pupils. His *Practical School of Composition* is well known.

D

D, THE fourth letter in the Græco-Roman alphabets, was called in the Semitic languages *daleth* (hence Gr. *delta*, i.e., "door;" and in all probability its original hieroglyphic or picture form was a door). The Greek Δ, in fact, yet preserves a recognizable resemblance to the door or opening of a tent, the kind of door most familiar to a nomadic people. D. belongs to the order of letters called *dentals* (see LETTERS, ALPHABET), *t*, *d*, *th* (in *th*in), *th* (in *th*ine), and in the corresponding words of sister-languages is often exchanged with those of the same order or organ, thus: Ger. *du*, Eng. *thou;* Ger. *tod*, Eng. *death;* Lat. *duc-*, Eng. *tug;* Lat. *duo*, Eng. *two*. A more remarkable interchange is that between *d* and *l*, and *d* and *r*. See L and R. D seems to have been drawn into some words (to which it does not radically belong) by a kind of affinity for *n*, as Lat. *canis*, Gr. *kyon*, Eng. *hound;* Lat. *gener-*, Eng. *gender*. *Di* followed by a vowel is sometimes transformed into J; as in *Janus* for *Dianus; Journal* from *diurnal*. *Di* followed by a vowel in Latin, has, in Italian, become *z;* and from MSS. and other evidence, we know that this sibilant sound of *di* prevailed, in the popular pronunciation at least, while Latin was yet a living tongue. Thus, *diabolus* is found written *sabolus*, and *Amazones*, *Amadiones*.—D, the Roman numeral for 500, arose out of the character Iↀ See NUMERALS.

D, in music, is the second note in the natural scale, and is a whole tone above C, to which it stands in mathematical proportion as 9:8, that is, when C vibrates eight times, D vibrates nine times. The whole tone from C to D is called the greater whole tone, being a comma larger than the next whole tone from D to E.

DAB, *Platessa limanda*, a fish of the same genus with the plaice and flounder, and very much resembling them, but easily distinguished from either of them by its more uniform and lighter-brown color, the roughness of its scaly surface, and its more curved lateral line, which rises into a high arch over the pectoral fin. It is common on all sandy parts of the British coasts, inhabits deeper water than the flounder, and does not, like it, enter the mouths of streams. It is known on the coasts of the firth of Forth as the salt-water fluke. It is preferred to the flounder for the table. It seldom exceeds 12 in. in length. A rather larger species of the same genus, less plentiful on the British coasts, is the LEMON D. or SMOOTH D. (*P. microcephala*). Its body is smooth, its color a pretty

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mixture of various shades of reddish-brown and yellow: its head and mouth are very small.

DABCHICK. See GREBE.

DABOLL, NATHAN, 1750–1818; a teacher in Connecticut, author of a famous school arithmetic. His son C. L. invented the fog-horn or fog-trumpet.

DA CA'PO (Ital. from the beginning), a term in music, frequently placed at the end of a part or movement, indicating that the performer must return to the beginning of the movement, or to some other part of it usually marked with the sign 𝄋, and finish where the word *fine* is placed. Scarlatti was the first who introduced the use of the *da capo* in his opera of *Theodora*. The words are generally abbreviated, thus, D. C., sometimes *D. C. al fine*.

DAC'CA, the district of which the below-mentioned city is the capital, extends in n. lat. from 23° 12′ to 24° 17′, and in e. long. from 90° 11′ to 90° 58′, containing 2797 sq. m., and numbering (1891) 2,421,000 inhabitants. Forming part of the great delta of the Ganges and Brahmaputra, it is traversed by streams in every direction, being so low and level as to be generally flooded during the rainy season. It is, on this account, admirably adapted to the cultivation of rice. From the character of the country, roads—happily rendered less necessary by the net-work of rivers—are very difficult of construction. In addition to the city of its own name, the district has two principal towns, Narainganj and Islampoor. Though the climate, as a whole, is moist, yet it by no means presents uniformity in this respect, the annual rainfall varying in different years from 46 to 93 inches. Among commercial crops, cotton—the raw material of the far-famed muslins—once occupied a prominent place. It was in 1765—the epoch of the cession of Bengal, Bahar, and Orissa on the part of the Great Mogul—that D. became subject to England; but down to 1845, the heirs of the native ruler succeeded each other as stipendiaries of the East India Company. Dacca is also the name of a division in Bengal, having an area of 15,045 square miles and a pop. in '91 of 9,844,000. It comprises besides the district of Dacca, Faridpur, Bakarganj, and Maimansingh.

DAC'CA, a city of Bengal proper, stands about 150 m. to the n.e. of Calcutta, in lat. 23° 43′ n., and long. 90° 25′ east. It is situated on the Burha Gunga, a considerable auxiliary of the Dulasseree, which is itself at once a mingled offset of the Brahmaputra and the Ganges, and an affluent of the lower course of the former stream. The city thus enjoys singular facilities in the way of inland navigation. Down to the close of the 18th c., D. was widely celebrated for the delicate texture of its muslins, which, in the phraseology of the east, were characterized as "flowing water" and "evening dew," and, in connection with this manufacture, the French and the Dutch as well as the English, had extensive establishments in the place. Since 1801, however, these European agencies have disappeared; while the annual value of the elegant fabric, under the influence of British competition, has gradually fallen to a small fraction of what it was formerly. The present aspect of the city is in keeping with this utter decay of its staple trade. In many quarters are ruins overgrown with jungle, the haunts of tigers and serpents; and this remark is applicable to numerous splendid edifices, such as the residences of its native princes and the factories of its foreign sojourners. Still D., within a space of 4 m. in length by 1¼ in breadth, contains, by the census of 1891, 82,321 inhabitants. It seems, since 1870, to have partially recovered from the effects of its commercial decline, and produces lac, dye, soap, cheese, and gold and silver ornaments. Sometimes as many as 300 elephants are for sale in the depots here. There are numerous mosques, pagodas and places of worship belonging to Romanists, Armenians, Greeks, and English, as also a college and several schools. D. is connected with Calcutta by the Eastern Bengal railway. The maximum temperature is about 89° and the minimum is 54.6°. The rainfall averages 82 inches.

DACE, DARE, or DART, (*leuciscus vulgaris*), a fresh-water fish of the family *cyprinida* (q.v.), and of the same genus with the roach, ide, chub, bleak, minnow, etc. It chiefly inhabits the deep and clear water of quiet streams. It is found in Italy, France, Germany, etc., and in some of the rivers of England, but is very local. It is in form not unlike the roach, but rather more elongated; the mouth is rather large, the scales smaller. The upper parts are dusky blue, becoming paler on the sides, and passing into white on the belly, the cheek and gill-covers silvery white. The D. is gregarious, and swims in shoals. Its flesh is preferred to that of the roach, but is not highly esteemed. The D. is perhaps the liveliest and most active of the *cyprinidæ*, and affords the angler fair sport both with fly and bait. It is fished for with a light float and a fine gut-line. The float is set so that the bait may almost touch the bottom. At the least symptom of a bite, the angler must strike quickly. The best baits are the red-worm, the tail of a lob-worm, gentles, greaves, and flies or grubs of any kind. The best places to fish with bait are moderately sharp streams, of from 2 to 4 or 5 ft. deep. Dace at times take the fly very freely, and show capital sport. Small red and black palmers will be found the most useful flies for the purpose, and their killing properties will be greatly increased if the hook is tipped with a tough gentle, as D. are very apt to follow the fly without taking it.

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DACE'LO, a genus of the kingfishers, natives of Australia. One specimen is known as the laughing jackass, so called because of its harsh discordant note.

DACHSHUND, a name adopted from the German, signifying "badger-dog." The dachshund has been common in Germany for many years, but was unknown in England until introduced by the late Prince Consort; it then became very fashionable and popular, but is not now so common. The dachshund is a small dog, weighing about 20 lbs., with short crooked fore-legs and an extremely long body, its head rather resembling that of a miniature bloodhound. Its strong, large paws enable it to dig rapidly. Its color should be black and tan, or brown. On the Continent the dachshund is extensively used for covert-shooting, but rarely so in Britain, as his headstrong disposition somewhat spoils his usefulness. The dachshund is closely akin to the old English Turn-spit, employed to drive a wheel by which roasting spits were turned.

DA'CIA, the land of the Daci or Getæ. Its geographical limits were very indefinite until its conquest by the Romans. After that period, it comprised the various countries now known as eastern Hungary, Transylvania, Bukowina, Moldavia west of the Pruth, Wallachia, and the Banat of Temesvár. The Getæ came originally from Thrace, and were divided into various tribes. Their course northward can only be imperfectly traced, but we know that, shortly before the time of Alexander the great (335 B.C.), they had migrated across the Danube. It is not known when or for what reason the Getæ changed their name to Daci. They seem to have been the most valiant of the Thracian barbarians. Curio, the first Roman general who ever penetrated as far n. as the Danube, did not venture to assail them. Julius Cæsar, however, is said to have intended their subjugation. In 10 B.C., Augustus sent an army up the valley of the Maros. From this time, there was almost continual fighting between the Romans and the Daci, on the whole, to the advantage of the latter, who actually compelled their civilized enemies, in the reign of Domitian, to pay tribute In 101 A.D., the emperor Trajan crossed the Theiss, and marched into Transylvania, where he fought a great battle near Thorda. The peasant calls the battle-field to the present day *Prat de Trajan* (*Pratum Trajani*, field of Trajan). The Daci, who were commanded by their famous chief Decebalus, were defeated. A second expedition of the emperor's (104 A.D.) resulted in the destruction of their capital, the death of Decebalus, and the loss of their freedom. Roman colonists were sent into the country, a bridge was built over the Danube—the ruins of which are still extant—and three great roads were constructed. In 270–75 A.D., the Romans abandoned the country to the Goths, and the colonists were transferred to Mœsia. After a series of vicissitudes, D. fell into the possession of the Magyars in the 9th century.

DACIER, ANDRÉ, a French author, b. of Protestant parents at Castres, in upper Languedoc, 6th April, 1651, studied at Saumur; and in 1672, came to Paris, where he was employed to bring out an edition of the Latin writer *Festus*, for the use of the dauphin, which he did in 1681. In 1683, he married Anna Lefèvre, also a Protestant, and two years later, both entered the Roman Catholic church. D. subsequently became royal librarian, member of the academie des inscriptions, and perpetual secretary of the "academie." He died 18th Sept., 1722. D.'s principal works, besides his *Festus*, are *Œuvres d'Horace en Latin et en Français* (Par. 1681–89), an edition of Valerius Flaccus, and numerous translations into French of Greek authors, such as Plutarch and Epictetus, all of which are of very mediocre quality, while the expositions and criticisms are extremely shallow.

ANNE DACIER, wife of the preceding, was b. at Saumur in 1654, and after the death of her learned father, who had developed her talent, came to Paris, where she acquired such a reputation by her edition of Callimachus (1674), that the duke of Montausier commissioned her to edit several of the ancient authors for the use of the dauphin. Similarity of tastes and employment led to a marriage between her and André Dacier. Her domestic duties did not, however, weaken her literary ardor. Besides editing various of the classics, she translated the comedies of Terence; the *Amphitryon*, *Epidicus*, and *Rudens* of Plautus, accompanied by an able dissertation on the origin, progress, and mutations of dramatic poetry; Anacreon, Sappho, and the *Plutus* and *Clouds* of Aristophanes. Her admiration of Homer was unbounded, and, in spite of her sex, involved her in two learned controversies. Madame D. is generally acknowledged to have possessed a more acute and vigorous mind than her husband. She died 17th Aug., 1720.

DACOITS, the name given to a class of men in northern India, who live by robbery and plunder. They were formerly employed in war by the native sovereigns. It is stated that one tribe alone, between 1818 and 1884, killed 172 persons and obtained plunder valued at $575,000. Much has been done to break up the roaming bands, but they are not yet extinct in Bengal and Burmah.

D'ACOSTA GABRIEL or URIEL. See **ACOSTA, GABRIEL.**

DA COSTA, ISAAC. See COSTA, ISAAC, DA.

DACOTA INDIANS. See SIOUX, and INDIANS.

DACRYDIUM, a genus of trees of the natural order *taxaceæ*, having male and female flowers on separate trees. The species are lofty trees, chiefly natives of Australia and

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New Zealand. *D. Franklinii* is called HUON PINE, although rather a yew than a pine. Its timber is harder than any Baltic pine, and is excellent for spars for naval purposes. *D. taxifolium*, the kakaterra tree of New Zealand, attains a height of 200 ft., and is also very valuable for its timber. A beverage resembling spruce-beer is made from its branches.

DAC'TYL (Gr. *dactylos*, the finger), the name of a measure or "foot" in Greek and Latin versification, consisting of a long and two short syllables, as in the word *ōmnĭbŭs*. It was so called from its resemblance to the finger, which consists of three joints—one long and two short. The same name is sometimes applied to a trisyllabic measure in English verse, consisting of one accented syllable and two unaccented syllables, as in *dēstiny*. See VERSE. Dactylic verses consist of dactyle and equivalent feet. See HEXAMETER.

DACTYLIOMANCY. See DIVINATION, SUPERSTITIONS.

DAC'TYLIS. See COCK'S-FOOT GRASS.

DACTYLOL'OGY, the art of communicating thoughts by the fingers. See DEAF AND DUMB.

DACTYLOP'TERUS. See FLYING GURNARD.

DADDY-LONG-LEGS, the popular name of an insect belonging to the genus *tipula*, and common in the United States. See CRANE FLY.

DADE, a co. in s.e. Florida bordering on the Atlantic ocean and Mexican gulf; 5636 sq.m.; pop. '90, 861 with colored. It is the wild swampy region of the Everglades. There is one good harbor near, cape Florida. Co. seat, Juno.

DADE, a co. in n.w. Georgia on the Tennessee and Alabama border, intersected by the Queen and Crescent route railroad; 186 sq. m.; pop. '90, 5707, includ. colored. It is a rough region, having iron, coal, and other minerals. Co. seat, Trenton.

DADE, a co. in s.w. Missouri, on the Sac river; 500 sq.m.; pop. '90, 17,526, incl. colored. Agriculture is the main business. Co. seat, Greenfield.

DA'DO (Ital. a die), in classical architecture, the term applied to the cubic block which forms the body of a pedestal. It is also applied to the plane face and the series of moldings which, in the interiors of buildings, form, as it were, a continuous pedestal. The interior D. is formed of wood, and, running round the bottom of the walls of a room, serves to protect the plaster or paper from injury. It is generally about three ft. in height, and surmounted by a narrow cornice.

DÆDALUS, according to the Greek myths, was sprung from the old Athenian race of kings, the Erechtheidæ, and was a contemporary of Theseus and Minos. He was famous for his ability as an artist and mechanician. Among the numberless works which he is said to have executed, may be mentioned the Cretan labyrinth, the Colymbethra, or reservoir, near Megaris in Sicily, the temples of Apollo at Capua and Cumæ, that of Artemis Britomartis in Crete, and an altar sculptured with lions on the Libyan coast. His mechanical genius is clearly celebrated in the poetic fiction of his flying safely over the Ægean by means of wings which he had himself made. D. got the credit among the Greeks of having invented carpentry, and most of its tools, such as the saw, the axe, the plumb-line, the gimlet, as also glue. The history of D. is obviously a myth.

DAENDELS, HERMANN WILHELM, a Dutch gen., was b. in 1762 at Hattem, in Gelderland, took part in the revolutionary disturbances that broke out in Holland in 1787, and was in consequence compelled to seek refuge in France. In the campaign of 1793 he rendered important service to Dumouriez, and was elevated to the rank of a gen. of brigade. In 1799, he commanded one of the two divisions of the republican army, which, with a third corps under the orders of Gen. Brune, compelled the Anglo-Russian forces to surrender. Circumstances induced him to leave the service in 1803, but in 1806 he was reinstated in his former rank by the king of Holland. He now conquered East Friesland, and was made governor-general of Münster, commander-in-chief of the Dutch cavalry, marshal of Holland, and governor-general of the Dutch East Indian possessions. This last office he held from 1808 to 1811, and discharged its duties with great prudence. He also published a work upon his administration in Java, which was an important contribution to our knowledge of that island. On the overthrow of Napoleon, his services were secured by the new king of Holland, Wilhelm I., who intrusted him with the organization of government in those colonies on the coast of Africa which had been restored to the Dutch. In this capacity he labored with energy and success until his death in June, 1818.

DAËT', a t. of the island of Luzon, Philippines, situated on a river of the same name, which falls into the bay of San Miguel on the eastern side of the island. Some of the houses are built of stone and some of nipa palm. Pop. about 8000

DAF'FODIL (corrupted from Lat. *asphodelus*), the English name of those species of *narcissus* (q.v.) which have a large bell-shaped corona. The common D. (*N. pseudo-narcissus*) is a native of England and of most parts of Europe, growing in woods and hedges. It is naturalized in many places in Scotland, but seems scarcely indigenous

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All the other species are more southerly, chiefly abounding in the countries near the Mediterranean. Some of them, as *N. minor*, have become naturalized in some places in England, having been long known as ornaments of gardens, in which double-flowered varieties are also cultivated. They are favorites, not so much for their beauty, which is not of the most delicate kind, as on account of their large yellow flowers, which are produced early in spring. The bulbs are purgative and emetic. The mode of cultivation is the same as for other species of narcissus.

DAG, a thick clumsy pistol, used in the 15th and 16th centuries. In the *Spanish Tragedy*, published in 1603, one of the characters shoots the dag.

DAGGER, a weapon resembling a sword, but considerably smaller, being used for stabbing at close quarters. Daggers are generally two-edged, and very sharp towards the point. Originally, it had no guard for the hand, and was worn at the girdle in a sheath. It is now regarded as a general military weapon in European countries.

DAGGETT, NAPHTALI, 1727–80; b. Mass.; graduate of Yale, and professor of divinity in the college. He was president from 1766 to 1777. When the British attacked New Haven in 1779, he was so badly treated by them that he never recovered. He published an account of the famous "Dark Day in New England."

DAGGETT, OLIVER ELLSWORTH, D.D., son of David; b. Conn., 1810; a graduate of Yale; Congregational pastor for 23 years in Canandaigua, N. Y.; then for three years professor of divinity in Yale college; afterwards pastor of the Second church, New London, Conn. He was one of the compilers of the *Connecticut Hymn Book*, and he wrote many articles in the *New Englander*. He d. 1880.

DAGHESTAN' (Tartar, *Tagh stan*, signifying mountainous country), a province of Asiatic Russia (called also Derbend), between the Caucasus and the w. coast of the Caspian sea. Area about 11,000 sq. miles. Pop. '92, 609,380. The surface is generally mountainous, being traversed by offsets from the Caucasus, but there are, however, valleys and level tracts of great fertility. The inhabitants are chiefly Lesghians (fanatical Mohammedans). Until 1812, the country belonged to Persia. Since its annexation by Russia, the Lesghians have fought desperately for independence (see SHAMYL and CAUCASUS). The chief towns are Derbend (q.v.) and Temirkhanshura, the capital.

DA'GÖ, an island in the Baltic sea, forming a part of the Russian government of Esthonia, situated near the entrance of the gulf of Finland. The narrow channel called Sele-sund separates it from the island of Oesel on the south. Its length is estimated at about 34 m., and its breadth at 15 miles. The soil, a mixture of sand and chalk for the most part, is not fertile, the coasts are rocky, and shoals make navigation dangerous. The population, Esthonians mostly, number about 15,000.

DAGO. A name originally given by sailors to Spaniards, Portuguese, and Italians in general. It is claimed by some to be a corruption of the frequent Spanish name *Diego*, equivalent to the English names James or Jack. By others it is a title given exclusively to those born of Spanish parents, especially in Louisiana. By others, again, it is claimed to be purely a corruption, or a *nickname* derived from *hidalgo*, which, though a Spanish and not an Italian word, came by some accident to be applied to a foreigner of Latin Europe. Whatever the derivation of the word may have been, it is applied to that lower class of the southern Europe Latin element employed in America in the cheaper labor pursuits.

DAG'OBERT I., one of the early Frankish kings, b. about 602 A.D. He was the son of Clotaire II., and after the death of his father he reigned over the whole of the Frankish dominions. His court was remarkable for magnificence, rivaling that of Constantinople, but he was himself noted for debauchery. He died 638.

DA'GON (Heb. *dag*, a fish), the national idol of the Philistines, is frequently mentioned in Scripture; in profane history, the name by which it is known is Derceto. It is always represented on ancient medals as half-fish, half-woman, but the Hebrew writer or writers speak of it as a masculine being. Some scholars have attempted to show that the word D. comes from the Phœnician *dagan*, wheat; and that it is not the name of a fish-god, but of a god of agriculture. It is possible, however, to combine both notions, by supposing that D. was a deified mortal who had come in a ship to the coast, and taught the people agriculture and other useful arts. Ancient history abounds with such mythological personages, one of whom was called by the Babylonians *Odakon*, and is regarded by the learned Selden as identical with the fishy idol of the Philistines. See Illus., NINEVEH AND ASSYRIA, vol. X.

DAGUERRE, LOUIS JACQUES MANDÉ, 1789–1851; a French painter, in early life a revenue officer. He was especially successful as a scene painter for the opera, and afterwards in panoramic views on a large scale. He also opened a diorama in Regent's park, London. He lost heavily by a conflagration, but speedily re-established his fame on a secure basis by the invention of the daguerreotype, in which he was aided by Nicephore Niepce. Daguerre became an officer of the legion of honor. The progress of his invention—forming permanent pictures on prepared surfaces by the chemical

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action of light—was for a long time slow and tedious; but improvements came, until now the photograph may be taken in an instant, and even a horse under full run is portrayed as if not in motion.

DAGUERRE'OTYPE PROCESS, the name given to the original photographic process, as introduced by its inventor, M. Daguerre, in 1839. Notwithstanding that it has now become so unpopular, on account of the very circumstance which gives such perfection to the result—viz., the polish of the plate—it is a process which yields to none in point of microscopic perfection of detail and perfect gradation of shade. The pictures it yields are positive or direct, as given in the camera, though they also appear as negative when viewed at certain angles, and are the result of the successive action of the vapors of iodine, bromine, and mercury upon a highly polished surface of chemically pure silver. The manipulations involved in conducting the process are—1. Cleaning and polishing the plate; 2. Rendering the plate sensitive; 3. Exposing it in the camera; 4. Developing the latent image; 5. Fixing the picture.

A copper plate of moderate thickness is coated with silver by the electrotype or other suitable method, and then polished to the utmost possible extent, so as to obtain, though by mechanical means, a chemically pure surface; it is then exposed first to the vapor of iodine, and then to the vapor of bromine for a length of time, ascertained in practice by watching the beautiful succession of prismatic colors which begin to appear with the first contact of the vapor. The length of exposure in the camera which follows is determined by the amount of light at the time of operating, and the relation between the diameter and focal length of the lens employed. The development of the latent image, which is the next operation, is effected by exposing the plate in a suitable box to the vapor of mercury, which attaches itself to the various parts of the picture in proportion to the more or less intense action of the light. Those portions of iodide and bromide of silver unacted on by light, are next removed by immersing the plate in a solution of hyposulphite of soda; and the picture is subsequently fixed and intensified by pouring over its surface a solution of hyposulphite of gold, and applying heat; by which means it is coated with a thin film of metallic gold, and thereby rendered so permanent that it cannot be rubbed out by ordinary means, but requires a chemical solvent for its removal. It may be mentioned, in conclusion, that though M. Daguerre published, in 1839, the first *practicable* process for taking pictures by the agency of light, his experiments would seem to have been suggested by the researches of M. Niepce, who, in 1820, obtained impressions on silver plates rendered sensitive by exposure to the vapors of sulphur and phosphorus.

D'AGUESSEAU, HENRI FRANÇOIS, 1668–1751; chancellor of France. When little more than 21 years of age he was appointed one of the three advocates-general, and the eloquence and learning which he displayed in his first speech gained for him great reputation. In 1700, he was made procurator-general, and in 1717, advanced to chancellor. A year afterwards he was deprived of his office because of his firm opposition to the wild schemes of John Law. When more than 80 years of age, he retired from the duties of chancellor, still holding its rank.

DAHABEAH, the name given to a barge on the river Nile, much used by tourists, to whom they are hired by the week. They resemble in their conveniences and comforts the house-boats so popular on English rivers.

DAHL, JOHANN KRISTEN CLAUSEN, a Norwegian landscape painter, b. at Bergen, 24th Feb., 1788, was at first intended for the church, but afterwards devoted himself to art. He studied painting for six years under the direction of Prof. J. G. Moller. His first attempts were in *genre* and miniature. They did not exhibit much genius; but public attention was at length excited by a work which he exhibited in Dresden, in 1819, entitled "Cascade among Rocks in Norway." Next year, he went to Italy, where Thorwaldsen and the Prussian consul-general, Bartholdy, commissioned him to execute several works. In 1821, he was appointed professor of painting at Dresden, where he subsequently resided. D. was fond of reproducing on his canvas the picturesque scenes of his native country, which he often revisited. Among his more famous works are a "View of Naples," "Winter in Zeeland," "View of Bergen," "Scene from the Environs of Christiania," and a "Winter Scene on the banks of the Elbe," the last two of which attracted great attention at the Paris exhibition of 1855. D., who was a member of several academies, died at Dresden, 14th Oct., 1857.

DAHLGREN, JOHN ADOLF, 1809–70; b. Philadelphia; a distinguished officer in the U. S. navy, a midshipman in 1826. He served in Brazil and in the Mediterranean squadron, and on the coast survey, being commissioned as a lieut. in 1837. Somewhat later he was engaged in the ordnance department, where he procured the adoption of the Dahlgren gun. He was the inventor of a rifled cannon, and introduced bronze howitzers. In 1855, he was made commander, and when the war of the secession began, he was in command of the Washington navy yard. In July, 1862, he was appointed capt., and chief of the bureau of ordnance. The next year, he rose to rear-admiral, and had command of the s. Atlantic and subsequently of the s. Pacific squadron. In 1869, he again took command of the Washington navy yard.

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DAHLGREN GUN, named after John Adolf Dahlgren, rear-admiral of the United States navy, is the result of a careful series of experiments on the construction of large ordnance. One peculiarity consists in having relatively less metal in front of the trunnions, and more behind, than had hitherto been customary. Dahlgren guns, made to fire shells or hollow shot, have been introduced to a considerable extent in the U. S. navy. See ARTILLERY; ORDNANCE.

DAH'LIA, a genus of large perennial herbaceous plants of the natural order *compositæ*, sub-order *corymbiferæ*, natives of Mexico. All the varieties in cultivation in our flower-gardens, of which not fewer than 2,000 have been carefully enumerated, are derived from two species, *D. variabilis* and *D. coccinea*, and chiefly from the former. Few plants manifest so strong an inclination to sport and produce new varieties as the D., and florists have also obtained many by the artificial fecundation of one with the pollen of another. Dahlias were first brought to Madrid by Spanish botanists in 1789, and were soon introduced into England, but did not become well-known in English flower-gardens till about 30 years after. The name was given in honor of Dahl, a Swedish botanist; but because another genus of plants had received the same name, an attempt was made to change it to *Georgina*, which is sometimes used on the continent, but D. universally prevails both popularly and among botanists in America. Among the most essential characteristics of a fine D., according to the estimation of florists, are a fullness of the flower, a perfect regularity in the shape of the florets, and the absence of an eye or disk; and florets of the disk, as in other "double" *corymbiferæ*, having assumed the appearance of florets of the ray. Dahlias have tuberous roots, which contain a considerable quantity of *inulin* (q.v.), and are in use as an article of food in Mexico. It was at one time attempted to introduce them into cultivation in Europe for the food either of man or of cattle; but the taste is nauseous to European palates, and even cattle do not readily eat them. Dahlias are often cut down in the northern parts of America by early frosts, in the very midst of their flowering; and their tubers require to be taken up for the winter, and stored in a dry place out of the reach of frost till spring. They are propagated by seed, by cuttings, and by tubers.

DAHLMANN, FRIEDRICH CHRISTOPH, professor of history and political science in the university of Bonn, was born, May 17, 1785, at Wismar. His earlier studies in Copenhagen and Halle were devoted to archæology and philology; but his attention was subsequently directed to the study of politics and the history of the middle ages. The results of his diligence appeared in his *Vita Ansgarii*, his *Researches in German History* (2 vols., Altona, 1822–23), his edition of the *Dithmarsh Chronicle* (Kiel, 1827), and other works. In 1829, D. was appointed professor of political science in Göttingen, where he published (1830) his valuable work on the *Sources of German History*. Banished in 1837, by king Ernest of Hanover, on account of his protest against the abolition of the Hanoverian constitution, he went to Leipsic and Jena, where he wrote his historical masterpiece, the *History of Denmark* (3 vols., Hamburg, 1840–43). In 1842, he became professor of history at Bonn, and took a prominent part in the political affairs of Germany after the movement in 1848, heading the constitutional liberals, who were unfortunately too reasonable to be successful. At the close of the struggle, he returned to his academic duties, to which he devoted himself till his death, 5th Dec., 1860.

DAHLONE'GA, a town and co. seat of Lumpkin co., Ga., 70 m. n.n.e. of Atlanta, in the midst of a gold-mining region, remarkable chiefly for the mint established there, 1835, abandoned in 1871, and since occupied by the North Georgia Agricultural college. Dahlonega is an anglicized Cherokee name meaning dollar-yellow, in reference to the gold coinage. Pop. '90, 896.

DAHOMEY, a native state of Western Africa, extending along the coast from fort Badagry on the e., to the river Volta, which separates it from Ashantee on the west. On the north it borders on the Wangera territory. It is within the French sphere of influence, and has an area of about 4000 square miles. D. is for the most part a vast plain, rising with gentle ascent from the sea towards the Kong mountains, with offsets of which it is traversed in its most northerly parts. Although it has no river of any importance save the Volta on its western boundary, it is well watered by springs and streams; and the soil, a rich, red-colored clay, almost quite free of stones, is extremely fertile. Magnificent trees clothe the hills in the n., and maize, beans, and peas grow in splendid luxuriance on the plains, as well as yams, potatoes, melons, limes, oranges, pineapples, and other tropical fruits; cotton, sugar, tobacco, and indigo are also raised. Most of the trade passes through the ports of Whydah and Kotonu. The scenery is described as exceedingly varied and beautiful. Lions, tigers, elephants, hyenas, and enormous snakes of the boa kind abound. The Dahomeyans, who came into possession of this tract of country about the beginning of the 18th c., are for the most part tall, well formed, and intelligent, and, for an African race, singularly honest, and far advanced in agriculture. They are of pure negro blood and belong to the Fon branch of the Ewe family. With the exception of a few Mohammedans, whose religious belief is in no way interfered with, they are all pagans, and practice fetish-worship. Until the French conquest (1892–4) the king was the most absolute of despots. Wholesale murder is one of the chief features in religious and state ceremonies; but, according to capt. Burton,

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who visited D. in 1864, the number of the victims has been greatly exaggerated. Still, as many as 500 human victims have sometimes been sacrificed at one "grand custom." The king maintains a considerable fighting force, part of which consists of women. The revenue formerly depended greatly upon the sale of slaves; but the vigilance of the cruisers employed to prevent the traffic has reduced this source of income materially. Hence the monster slave-hunts which periodically took place are now comparatively rare. In 1876 the coast of D. was placed under a strict blockade by Great Britain, on account of an outrage on a British subject, for which the king of D. refused satisfaction. Pop. 150,000.—ABOMEY (q. v.), or AGBOME, the capital, has a population estimated at 20,000. Its port is Whydah. In 1892 the French colonists on the coast came in conflict with the Dahomeyans, and a French army under General Dods defeated King Behanzin and took Abomey (December). In January, 1894, King Behanzin surrendered unconditionally and the French sanctioned the choice of a new king by the chiefs. The kingdom is thus a French protectorate. See Forbes, *Dahomey and the Dahomeyans;* Burton, *Mission to Gelele* (2d ed., 1864); Skertchley, *Dahomey as It Is* (1874); and Bouche, *La Côte des Esclaves et le Dahomey* (1885); and Aublet, *La Guerre au Dahomey* (1894).

DAH'RA, a district of Algeria, once inhabited by the Ouled-Riahs, a Kabyle tribe. It has acquired a melancholy celebrity as the scene of a frightful massacre perpetrated by the French in the month of June, 1845. The district contains immense caverns. In these the Ouled-Riahs, hotly pursued by the French under Col. (afterwards Marshal) Pelissier, took refuge. They were ordered to surrender their arms and horses, and were promised, in return, life and liberty. On their refusal, fascines were made up, kindled and placed at the entrance of the caves. Thrice Col. Pelissier sent a flag of truce, exhorting the imprisoned Kabyles to accept his terms, but in vain—the last messenger being received with a discharge of musketry. The fire was therefore again kindled in all its intensity, and gradually the cries of agony from the interior of the caverns ceased, until nothing broke the dead silence but the occasional crackling of the green wood of which the fascines consisted. When the caverns were examined, about 600 dead bodies were found scattered here and there; but it was calculated that in all (including those who afterwards died and those who could not be got at), about 800 had been suffocated by smoke, or gored to death by the maddened cattle whom they had brought with them into their fatal asylum. The news created a great sensation in Paris. Marshal Soult, then minister of war, formally condemned the deed; but Marshal Bugeaud, the governor of Algeria, affirmed that Pelissier had only acted under positive orders.

DAILLE or **DAILLÆUS**, JEAN, 1594–1670; a learned Protestant divine, tutor to the grandsons of Plessis Mornay, and the author of a number of controversial works. He was president of the last national synod held in France in 1659.

DAIMIE'L, a t. in Spain, in the province of Ciudad Real, twenty m. e.n.e. of the city of that name. It is in general tolerably well built; it has several squares, and its principal streets, though unpaved, are wide and comparatively clean. Its chief buildings are the churches of San Pedro and Santa Maria—the former a Doric, and the latter a Gothic structure—a town-hall, and a hospital. D. is environed by fine public walks and gardens, and has manufactures of woolens, linen, blonde lace, etc. Pop. 10,000.

DAI'MIO, the official title of the feudal lords of Japan, having almost independent rule in their special provinces or districts; but modern changes have brought to an end their privileges and authority in the direction of the consolidation of the empire.

DAIR-EL-KA'MAR, or DEIR EL-KAMR, a t. in Syria, and the capital of the Druses, about 13 m. s.s.e. of Beyrout. It is situated on the edge of a deep and picturesque glen of Mt. Lebanon, the banks of which and the slopes above are richly clad with mulberries, olives, and vines, which are cultivated in terraces by an exceedingly industrious population. On the opposite side of the glen stand the ruins of the palace Bteddin, formerly the residence of emir Beshir, who, for more than half a century, from 1788 to 1840, ruled over the Lebanon with a strong but impartial hand. Pop. of Dair-el-Kamar about 8,000.

DAIRY, all that concerns milk and its management on a farm; or the place or house where the milk is kept, cheese made, etc. (The old word *dey*, the milkmaid who presided over the *deyry* or dairy, is probably allied to *dug*, a teat, and to Lat. *duc-*, to draw, or milk; in Polish, *doic* is to milk; and in Sw. *deja* is a dairymaid.) Like almost all other occupations, dairying has become in recent years divided into several distinct and special lines. These differ as to the form of the product and the manner of disposing of it. In one case milk or cream may be produced for delivery to consumers direct from the dairy, or the same products may be delivered to a creamery to be manufactured into butter and cheese, or the product of the herd may be converted into butter and cheese at home. Upon the particular kind of dairying to be followed should depend the character and composition of the herd of cattle.

The selection of cattle of a sort profitable for the dairy, is a point of the first importance. Within the general class of dairy cattle are found a great variety of breeds, so that it is easy to select a particular one adapted to any special conditions of dairying. Some cattle are noted for the quality of the milk they produce, while others, again, under

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some circumstances combine quantity and quality in a specially economical way. Generally these different dairy characteristics pertain to different breeds, so that every dairyman will find some one breed of dairy cattle better suited for his purposes than any other. The best breeds for milk supply, for butter making or for the cream trade are easily selected It has been proved that the best cow for butter making is the best for cheese. The cows of the Channel islands also stand in high repute. The elegant, deer-like Alderneys are kept, more especially in England, by those who prize rich milk, and many landed proprietors and farmers have one or two amongst their herds to impart a higher color and richer flavor to the milk and butter. Alderneys frequently give 16 quarts of milk daily, and 8 or 9 lbs. of butter per week, while instances occur of their yielding as much as 12 or 14 lbs. The small Brittany breed, scarcely larger than goats, have also been brought to Great Britain, and are profitable for gentlemen's families, and where only one or two cows are kept. These breeds are, however, in little favor with those who, besides dairying, look also to the breeding of profitable grazing-stock. Some families of the Shorthorns unite, with size, substance, and aptitude for fattening, excellent milking properties. Shorthorns, or animals with a large infusion of Shorthorn blood, constitute the bulk of the handsome and high-priced cows seen in metropolitan markets, and long preferred to all others by the London dairymen. Throughout the n. of England, such cows were in favor, and were used by the late Mr. Horsfall, whose excellent papers on dairy management, published in the *Journal of the Royal Agricultural Society of England*, should be read by all interested in this subject. With his liberal dietary, fifteen to twenty cows daily average, for seven or eight months, ten or eleven quarts of milk each, producing a pound of butter. The original Shorthorns, in the hands of the brothers Colling, Mr. Bates, the Earl Ducie, and other earlier breeders, were excellent milkers; and even at the present day certain families are to be found still retaining their ancient character. The blood-red, plump Devons are more remarkable for the richness and butter-producing character of their milk than the quantity of it. The ancient Longhorns, once common in the midland counties of England, and prized for their milk, have mostly given place to more handy, symmetrical breeds. The polled Angus, the Galloway, and the West Highland cows have a fair quantity of milk of remarkably fine quality, that of the West Highland breed in particular. The small Shetland breed produces an astounding quantity of splendid milk, and so do the Kerry and some other Irish cows.

Good milking animals of every breed possess certain qualities in common, which guide the farmer in profitably recruiting his dairy-stock. They have neat, tapering, well-placed heads; large, prominent, bright eyes; small and rather narrow necks; light fore-quarters; oblique rather than upright shoulders; large and shapely udder, well under the belly; largely-developed milk-veins; a pliant mellow skin, well covered with soft silky hair; thin tail, with a good brush at the end of it; small and fine below the knee. Of great importance, also, is the fact of the animals being descended of parents possessing good milking qualities, for certainly no property is more distinctly hereditary. The milk of small and young cows is usually richer than that of larger or older animals. From four to eight is the most profitable age for the dairy-cow; after that, the milk is poorer; the animals eat more food, especially during winter; and, moreover, become less profitable when dried foods are used. There are two very different ways of forming a dairy herd, and maintaining its size and quality. It may be done by buying or by breeding, and these two methods may be combined. Where milk is produced for city supply, the purchasing plan is common. In this case, cows are bought when mature and in their prime, judged exclusively by their yield of milk. These are highly fed so as to keep steadily gaining in flesh, and as soon as they cease to be profitable as milkers are sold to the butcher The bull may be of any breed, as the calves in this case are only valued as veal. This method of making up a herd requires very rare judgment in buying, and always incurs the risk of bringing disease into the herd. The other extreme method is to begin with a few well selected animals as a foundation, and gradually build up the herd by judicious breeding and natural increase. This method, of course, takes time, but it is much safer and more satisfactory in its results, and is considered a higher grade of dairy farming. The selection of a bull is in this case of great importance, as the bull is always the main dependence for raising the quality of the herd. With the herd thus established, a record containing the history of each cow, and its dairy performance should be kept. Good judges believe that one-third of the cows in the entire country do not pay for the cost of keeping; so as a matter of business prudence, a sufficient record is of importance.

To produce large quantities of good milk, it is absolutely necessary that the cow be supplied with the materials which conduce to a great flow. These briefly consist of albuminous materials and phosphates for forming the caseine, and oily matters for producing the butter. Cows fed on meadow hay, when producing from 12 to 16 quarts of milk daily, require something more than even 20 lbs. of turnips or mangold to sustain them. A still greater falling-off in flesh and fat—a constant robbing, in fact, of the materials of the body to supply the secretion of milk—is observed in the case of some milk cows kept on the Scotch system on straw and a full allowance of turnips. Under better management, the expensive hay and roots may be materially reduced in quantity, and the adequate amount of nutriment supplied by such articles as bean-flower, rape,

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or cotton cakes, bran, malt coombes, and the like; whilst sufficient bulk—an important matter in the feeding especially of ruminants—is attained by the use of chopped straw. Large numbers of feeding experiments have been made under varying conditions in order to ascertain the food requirements of dairy cows. From these experiments, feeding standards have been worked out which give the amount of digestible protein, fat, and carbohydrates required per day. Wolff, a German, whose standards have been largely used, gives the following figures for milch cows per day, and per 1000 lbs. live weight: Total organic matter, 24 lbs.; protein, 2.5 lbs.; carbohydrates, 12.5 lbs.; fat, 0.4 lb. A great many analyses of American feeding stuffs have been made and compiled, and from these can be found just what quantities of different kinds of fodder will be required to comply with the standard ration given above. Cooking and steaming fodder is of no advantage unless large amounts of straw and coarse foods are used. In this case steaming is useful as a means of inducing the animals to eat sufficiently large quantities of the food.

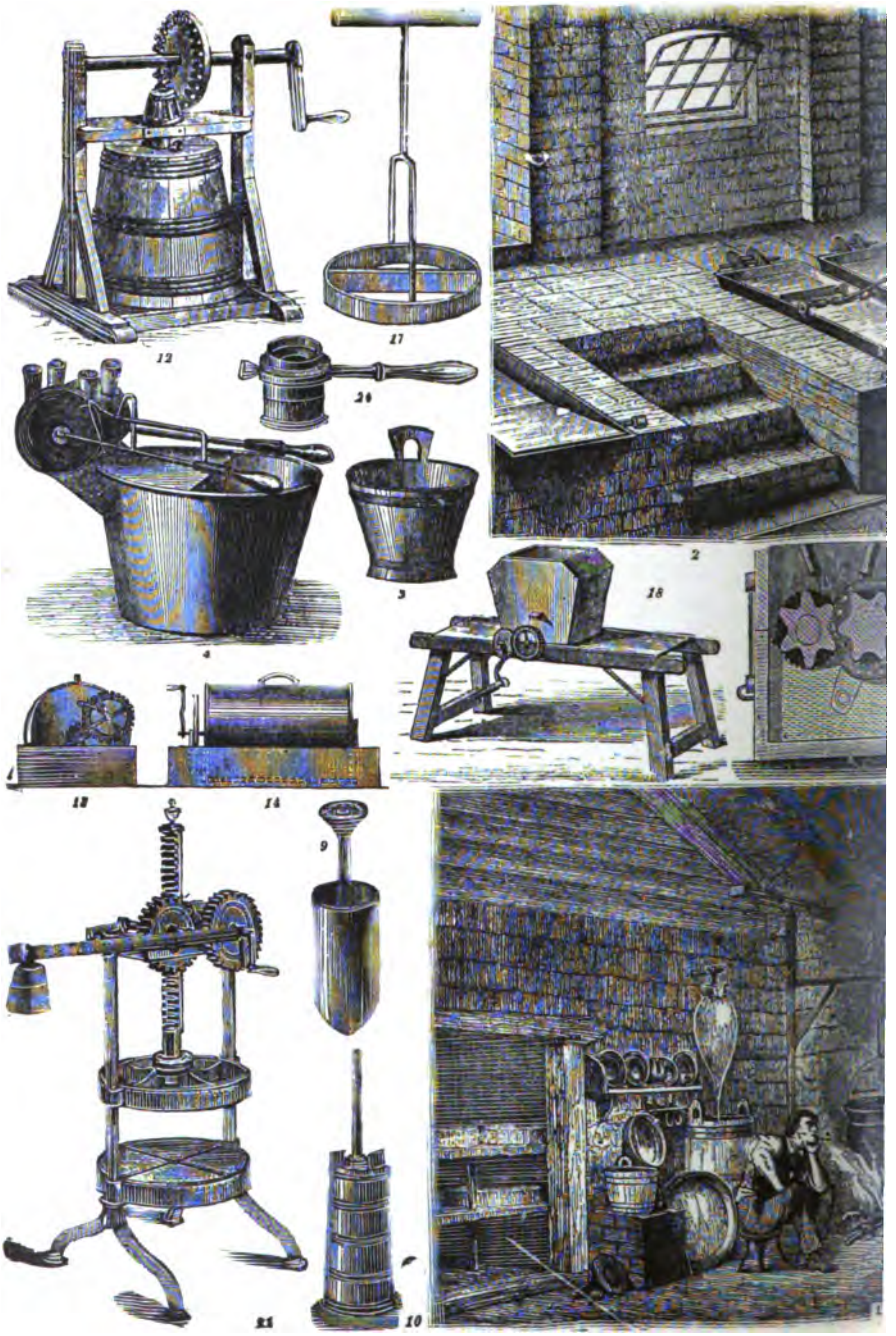
The summer-feeding of cows is more natural and less expensive than the winter. In the English dairy counties, they are grazed upon the old pastures which are for this purpose preferred to those more recently laid down; whilst in Scotland they are often pastured upon the clovers. They should never have to work hard for their meals, and should further receive in the house, when brought in for milking, cut clover and rye-grass. Unless in the case of very fine and rich pastures, an allowance of rape-cake is also advisable. Such management not only improves the yield and quality of the milk, but supports the cows in high condition, and maintains the pastures in high and increasing fertility. This last matter is worthy of consideration, for under the older system the tons of butter and cheese carried away from the soil left it poor and unprofitable. In such circumstances, the use of bones and other such manures, by improving the condition of the soil, greatly improved the nutritive quality of the grass and hay. The produce of good land in high condition is always more valuable alike for dairy and for feeding purposes. A given acreage will support more animals, if the produce be cut and brought to them, than if they are permitted to depasture it. The advantages of both systems are, however, secured by running the cows at grass during part of the day and giving them cut clover in the house during the remainder. Throughout the early and later part of the season, it is better that the animals be out during the day, and in at night; but in the intense heat of a warm summer, their being housed in the day secludes them from the attacks of troublesome flies, and permits their grazing undisturbed during the cool of the night. When cows run and jade themselves in the pastures during oppressive heat, their value as milkers is depreciated.

A good supply of water is necessary for milk-cows, which require much more than feeding-stock. In winter, they should have access to it at least twice a day, and require it still oftener in summer. Adequate shelter, and comfortable and convenient buildings are very essential to successful management. Unless the housing is good and comfortable, the materials which ought to go to the formation of butter are wastefully spent in supporting animal heat. Cows in full milk are most profitably kept in well-ventilated byres or hovels, of which the winter temperature should fall little below 60°.

The heifer may be put to the male when about two years old. The period of gestation is nine calendar months, or 284 days, but is usually shorter in young animals, and when the calf is a female. During pregnancy, cows fortunately are little liable to disease. Abortion occasionally occurs, and is most common about the third or fourth month. The heifer should receive the ordinary food of store-stock until within six or eight weeks of calving, when it is profitable to diet her as recommended for cows. It is a great mistake to starve cows in calf. They should be fairly and carefully fed, and milking suspended entirely for about 2 months, or at least 6 weeks before calving. In older cows, especially if good milkers, for a fortnight before calving, the bowels must be kept relaxed, the teats drawn, and any milk removed several times a day, and an occasional dose of salts given. Such simple precautions will prevent that apoplectic form of milk-fever which destroys so many excellent milk-cows. The enlargement of the udder, and appearance of milk, the loosening of the ligaments of the pelvis, the relaxation of the vulva, and the animal's evident desire to be alone, betoken the approach of parturition. The act is generally accomplished speedily and easily, and without requiring much assistance. The calf usually comes with its forelegs first, and its head rather on one side, with the nose between the knees. The cow often stands, and as the calf drops, the navel-string is ruptured. With a wisp of straw, the little animal is rubbed dry, and receives either from its mother, or from a bottle, a small quantity of the rich new milk popularly known as the "beastings" or cherry-curds technically termed the colostrum (q.v). In this the caseine is mostly displaced by more easily digested albumen; whilst the large amount of sugar and oily matter promotes the clearing out of the bowels. In few cases of dairying are the calves allowed to suckle their dams. Many of the calves are sold young, to graziers and feeders; others are intended for veal, and are fed highly for a short time on good milk, meal, and cake; while some —a few of the female animals—are fostered and reared with a view to fill blanks in the cow ranks. These latter get warm milk for five or six weeks, and skimmed for about as long, after which grass, early roots, and cake sustain them. For the first nine days, calves should be carefully muzzled to prevent them eating straw. They do not ruminate

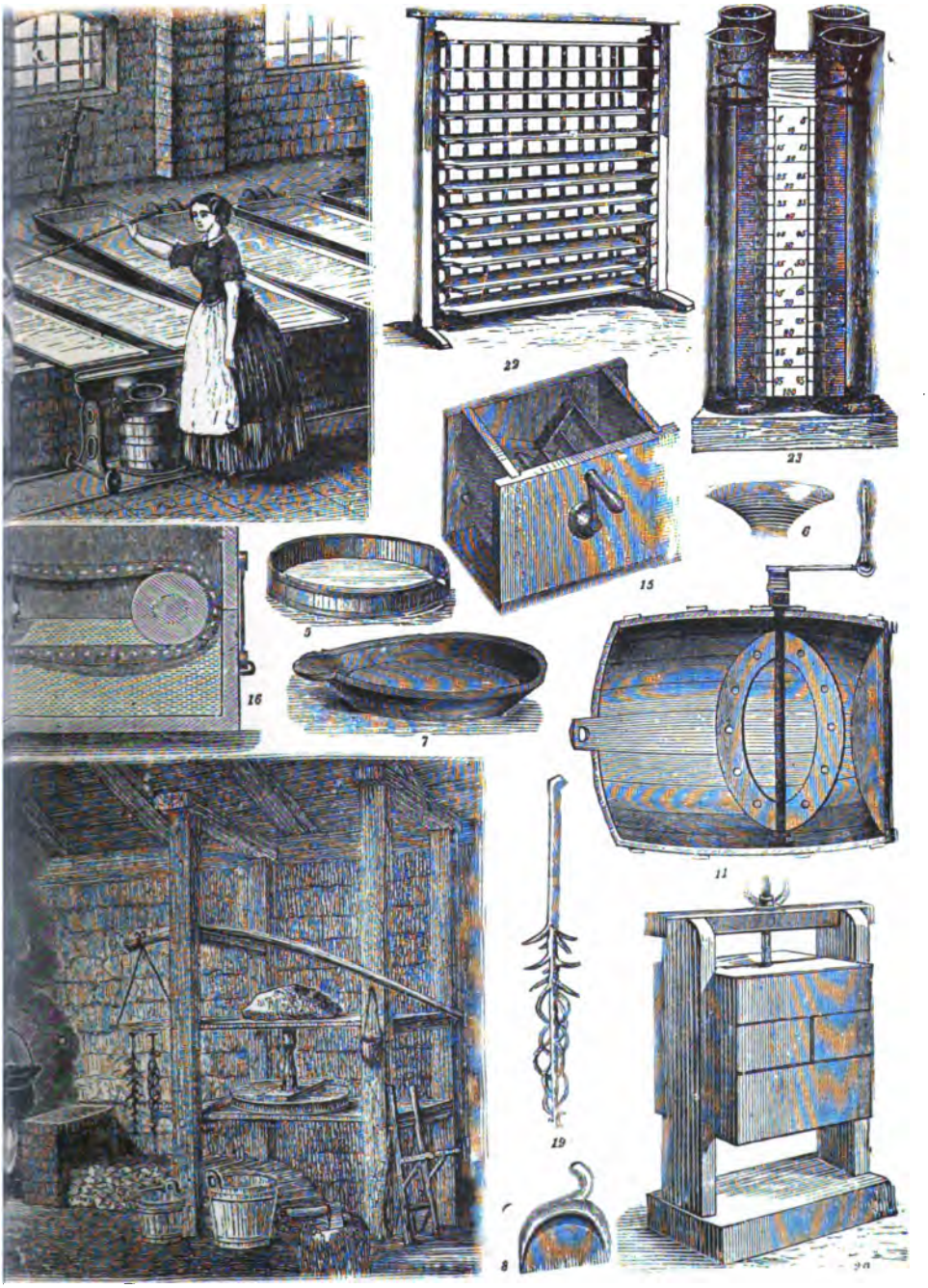
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THE DAIRY.—1. Interior of a Swiss cow-keeper's cottage. 2. Holstein milk-vault, with 6. Earthenware milk-bowl. 7. Cast-iron milk-pan. 8. Cream-ladle. 9. Lactome 13, 14. Lavoisy's butter-machine. 15. American butter-machine. 16. Butter-knea Rhenish). 21. English Cheese-press. 22. Cheese-turner. 23. Milk-gauge. 24. D

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Destinon's receptacles. 3. Milking-pail. 4. Mechanical milker. 5. Wooden skimmer. er (milk-tester). 10. Churn. 11. Cleve's barrel-organ churn. 12. Atmospheric churn. der. 17. Curd-cutter. 18. Curd-breaker. 19. Cheese-twirler. 20. Cheese-press (Lower nné's lactoscope.

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until the ninth day is passed, and if before then they eat any straw, death generally ensues. The cow after calving should have a drink of meal and tepid water, to which a little salt may be added. For the first week, steamed food, bran-mashes, with good hay, constitute the best food: roots at all times, and cold water during winter, are best withheld. Cleansing drinks are quite uncalled for; and if the placenta do not come away within 12 hours after calving, it may be very properly and safely removed by any one accustomed to such offices. After the lapse of a fortnight from the date of calving, roots may be given in considerable quantities, provided always the change has been accomplished gradually. Turnips touched by frost should be studiously avoided to cows either before or after calving, especially before.

In the successful management of milk, butter, and cheese, much depends upon the dairy itself. It should have, if practicable, a northern exposure. Proximity to sewers, pig-sties, or any offensive smells, must be sedulously avoided. Stone and lime are the best materials. The walls may be advantageously lined with a skirting of brick, or, where the cost is not objected to, with white glazed tiles. A lofty roof and free ventilation must be provided, with windows looking north. A double door is advisable—a light sparred one placed inside, useful in summer for freely admitting plenty of air; and a solid, well-fitting, boarded one, removable in summer, and necessary for keeping out the winter cold. The temperature of the dairy may be further moderated, in hot weather, by allowing a stream of cold water to trickle slowly over the floor, or, better still, round the milk-vessels, placed in large vats, and by hanging throughout the room coarse calico saturated with water several times a day. In winter, hot-water pipes, closed doors, windows protected by straw, and such other appliances, must be resorted to for the maintenance of the desirable temperature of from 50° to 56°. Further to insure an equable temperature, it is advisable to shelter the building with trees and shrubs, and, if possible, have it 4 or 5 ft. below the level of the ground. No animal food, drying ing clothes, or indeed anything else, except milk, butter, and newly made cheese, should ever enter its walls. To remove any acidity or noxious emanations, charcoal-powder is sometimes kept strewed on the shelves. An annual whitewashing of roof and walls helps to cleanse and purify. Daily must the floor and shelves be thoroughly scrubbed and washed, and not a drop of spilled milk allowed to remain for many minutes unremoved. By far the neatest and best shelves are of stone or slate, 2½ ft. wide, raised on stout iron rods about 2 ft. from the bricked or paved floor. The dishes are best made of earthenware, or oak lined with lead. Where many cows are kept, these last may be conveniently made 3 ft. wide, and 4 or 5 ft. long. They will thus project 6 in. over the shelf, and should be provided with a brass plug, by which the milk, when skimmed, can be drawn off without moving the vessels. These, and the milk-buckets, and, indeed, every article that comes in contact with milk or butter, must be kept scrupulously clean. Immediately after use, they should be rinsed out with cold water, and then with hot; wooden and metal articles well scoured with a scrubber, again washed, or, where practicable, dipped into a boiler amongst scalding water, and then set aside for several hours to dry, air, and sweeten. For scrubbing purposes, a small, tightly girded bunch of mountain heath, where such can be had, is best adapted, and failing it, a wisp of strong straw. These should be changed frequently. Indeed, the comparatively short period of their duration is a guarantee for that. Inattention to the proper cleaning and scouring of the dishes, especially in sultry weather, is sure to be marked by sour milk.

The milk, when brought into the dairy, is run through a wire-gauze or horse-hair strainer, into the vessels above described. To encourage the rapid rise of the cream, the layer of milk should be shallow, especially in summer. At the end of 12 or 24 hours, the cream is carefully removed; and in cool weather the milk may stand for another 12 or 24 hours, when it is again skimmed, the residue going to the pigs or calves. The cream removed at the first skimming is always richest and best; and where it is desired that the butter should be first rate, any subsequent skimmings may be kept separate, and churned by themselves. Churning at short intervals of twice or thrice a week is preferable to allowing the cream to stand for a longer period. Every time cream is added, the contents of the tank or cistern are well stirred, and a little salt added, unless, as in Scotland, where the butter is liked perfectly fresh. The cream should be kept as cool as possible, especially during the several hours preceding churning. For this end, in very hot weather, the cream-tank is sometimes lowered into a conveniently deep well, or placed for several hours in a water-cistern or under a running tap. In such weather, the churning, which generally occupies from 30 to 40 minutes, should be done at night, the butter laid in brine, and made up early next morning. When the whole milk is kept for churning, care must be taken never to add new milk to that which has already been sour. Cheese-making (see CHEESE) was a laborious process. Now, however, by the establishment of dairy factories in America, and latterly in England, much of the manual labor is saved.

At the close of 1895 the cows which may be properly regarded as dairy animals numbered in the United States about 17,000,000. Dividing these roughly according to their principal products, there are 11,000,000 cows chiefly butter producers, 1,000,000 cows which produce all our cheese, and 5,000,000 cows whose product is consumed as milk. These products and their values may be tabulated as follows:

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Cows.	Product.	Rate of product.	Total product.	Rate of value.	Total value.
11,000,000	Butter.	125 lbs.	1,375,000,000 lbs.	20 cents.	$275,000,000
1,000,000	Cheese.	280 lbs.	280,000,000 lbs.	8 cents.	22,400,000
5,000,000	Milk.	350 gals.	1,750,000,000 gals.	9 cents.	157,500,000

This gives the grand total value of dairy products of the country as $454,900,000, and to this may be added the feeding value of the skim milk, buttermilk and whey, also the value of the calves yearly dropped, making the aggregate value of the product of our dairy cows upwards of $500,000,000. By the old farm rule that a cow is worth whatever she will produce in a year, including her calf, the average value of the dairy cow in the United States will be about $30. A fair ideal standard for a dairy cow is 5,000 lbs. of milk or 575 gallons, and from 200 to 225 lbs. of butter. On this basis it will be seen that the average dairy cow is far below the standard, and there is much needed improvement in the quality of dairy cattle. There are probably several millions which do not produce the value of their annual feeding cost. It is claimed that winter is the best season for the manufacture and transportation of butter, and that the market is more favorable then than in summer. Mr. Boies, of Ill., the originator of winter dairying, says that he gives his cows, every morning, 4 qts. meal, and milks them while they are eating. A small amount of salt is then administered, with a quart of oilcake meal to assist digestion. The cows then drink warmed water, and if the weather is mild, are allowed to bask in the sun during the forenoon. When brought in, they are fed with early-cut hay; and at 5 P. M. each cow receives 5 qts. corn and oatmeal mixed together, after which she is milked. The stable must be protected from draughts; but there is more danger from an overabundance of heat than of cold. The difference in the milk to the pound, between winter and summer butter, is 25 per cent. in favor of the former; and fresh winter butter from the west has damaged the market for eastern butter made in summer. Our principal hotels are supplied with the winter product, which seldom sells for less than 45 cts. a pound. Butter dairying has made rapid progress, and the factories have raised the quality of the butter, most of which is consumed at home. There are many methods of setting milk, as e. g., the "pool-and-pail," the "shallow-pan" and the "Swartz" systems. This latter is named from the inventor, who discovered that milk, when set in ice water, would rapidly throw off its cream. There are also many systems of cream-gathering. The "Fairlamb" plan is to gather only the cream for the factory, setting the milk at the farm. The cans for collecting the cream are so nicely graduated that, when properly worked, one inch of cream represents the making of one lb. of butter. This system, which is popular in the west, saves the labor and expense of carrying milk, which is sometimes injured by jarring. The entire apparatus for a creamery for 500 cows costs $1,700; a "Fairlamb" factory costs about $2,500; The "centrifugal creamer" is a machine for separating the cream from the milk directly after it is drawn. By the centrifugal law the heaviest portion, which is the skimmed milk, is sent to the circumference, leaving the cream near the center. The "Danish Weston centrifugal milk separater" separates 1200 lbs. of milk per hour. In 1880 the creamery butter reported was only 3½% of the total, but in 1890 it had risen to over 15%. In 1896 it was estimated that the butter produced in the United States amounted to 1,400,000,000 lbs. of which more than ¼ or about 300,000,000 lbs. was made in creameries, of which there are nearly 10,000 now in operation. Since 1872 oleomargarine (q. v.), known in Gt. Britain as margarine and butterine, has been used in the U. S., and has become a formidable competitor with the true dairy product, the amount of butter displaced by it in 1886 amounting to one-fifth of the total product. Its use in adulterating both butter and cheese led to the passage in several states of laws restricting its use and sale. Oleomargarine factories are often associated with butter factories, and another part of the work of many of the latter is the manufacture of skim-milk into cheese, after adding some pure oil to it to make up for the loss of butter fat. Leading states in the products of the dairy are New York, Ohio, Illinois, Pennsylvania, Wisconsin, and Iowa. See BUTTER, CHEESE.

DA'IS (Fr.). This term was used with considerable latitude by mediæval writers. Its most usual significations are the following: 1. A canopy over an altar, shrine, font, throne, stall, chair, statue, or the like. The term was applied to the canopy without regard to the materials of which it was composed, which might be cloth, wood, stone, metal, or other substance. 2. The chief seat at the high table in a hall, with the canopy which covered it, from which probably the word in all its significations was introduced, its French meaning being a canopy. 3. The high table itself. 4. The raised portion of the floor, or *estrade*, on which the high table stood, and by which the upper was divided from the lower portion of the hall; and 5. A cloth of state for covering a throne or table. In old writings, the word occasionally takes the form of *dois*, and more rarely that of *dee* or *deis*.

DAI'SY, *Bellis*, a genus of plants of the natural order *compositæ*, sub-order *corymbiferæ*. The common D. (*B. perennis*), plentiful throughout Europe, flowers almost all the year in pastures, meadows, and grassy places. What are called double varieties, with flowers of various and often brilliant colors, are very commonly cultivated in

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gardens, the flowers consisting entirely of florets of the ray. A variety called the *hen-and-chickens, D.*, frequent in cottage gardens, has the flower (head of flowers) surrounded by smaller ones, the short stems of which grow from the summit of the *scape* or leafless stem. The D. (*gowan* of the Scotch) has long been a favorite with poets and lovers of nature, characteristic as it is of many of the fairest summer scenes, its blossoms gemming the pastures, and recommended also by its frequent appearance during the severer seasons of the year. Its flowers close at night. It is not found in America. A species of *bellis* is, however, found in the United States (*B. integrifolia*), but it is confined to Kentucky, Tennessee, Arkansas, and the s.w. states. Europe produces some species unknown in Britain, but of little interest; and species of the nearly allied genus *bellium* are also found in the s. of Europe. The flower commonly called D. or ox-eye D. in the United States is a species of chrysanthemum (*C. leucanthemum*). In the days of chivalry, the D. was the emblem of fidelity in love, and was frequently borne at tournaments both by knights and ladies.

DAISY, MICHAELMAS. See ASTER.

DAK, or DAWK, the mail post of India; also traveling by palanquin (q.v.). See BUNGALOW.

DAKAR, a seaport in the French colony of Senegal, Africa, situated about 1½ m. n. of Gorée and on the extreme point of cape Verd. It has an excellent harbor and is connected by railway with St. Louis, 163 m. distant. Pop. about 2000.

DAKKEH, a village of Nubia, situated on the left bank of the Nile. It was anciently called Pselcis, and contains a temple of the Ptolemaic era.

DAKOTA, a co. in s.e. Minnesota, on the Mississippi, intersected by several railroads; 575 sq. m.; pop. 1890, 20,240. The productions are chiefly agricultural, and the soil fertile. Co. seat, Hastings.

DAKOTA, a co. in n.e. Nebraska, bordering on S. Dakota and Iowa, and bounded e. by the Missouri; 280 sq. m.; pop. 1890, 5386. The surface is rolling prairie and the soil fertile. Co. seat, Dakota.

DAKOTA, or JAMES, a river of the n.w., rises near Devil's Lake, N. Dakota, and flows in a southerly direction, joining the Missouri in the vicinity of Yankton, S. Dakota. Including its numerous curves and bends, it is about 500 m. long, but is not navigable. The valley it drains is of great width and contains rich farming lands. This stream was called *rivière à Jacques* by the French.

DAKOTA FORMATION in geology is a kind of rock first described in Dakota, and belonging to the American cretaceous period. It is usually composed of beds of coarse yellow sandstone and is found from Texas to Canada on the western edge of the great plains. There are fossil shells and plants, and a valuable deposit of coal. Artesian water is also abundant, and is a much valued resource in parts of the country where the rainfall is slight.

DAKOTAS. See SIOUX.

DAKSHA, or DUKSHA, a deity of the Hindus, represented as wearing a goat's head, and regarded as an avatar (or possibly a son) of Brahma. He committed some offense for which he was put to death by Siva, but was afterward restored to life. His head, however, had been accidentally burned up, and Siva replaced it with that of a goat.

DALAI'-LA'MA. See LAMAISM.

DALARADIA, the ancient name of a territory in Ireland which comprehended what is now the southern half of the country of Antrim, and the greater part of the county of Down. It was sometimes also called *Cric na Cruithne*, "the region of the Picts," from the Irish name of its inhabitants, otherwise called the Dal Araidhe, "the race of Fiacha Araidhe," a chief or prince of Ulster, who is said to have lived about 236 A.D. The name continued in use till the end of the 12th century. It must not be confounded with Dalriada (q. v.).

DALBEATTIE, a town of Kirkcudbrightshire, near Urr Water, 15 m. s.w. of Dumfries. Founded in 1780, it owes its importance to the neighboring Craignair granite quarries and to its polishing works, which furnished granite for the Liverpool and Odessa docks, the Thames embankment, and many more works at home and abroad.

DAL'BERG (formerly, DALBURG), the name of an ancient and noble German family, of which several members held, by hereditary right derived from the oldest times of the middle ages, the office of chamberlain to the archbishopric of Worms. So great was the renown of the D. family, that at every coronation of a German emperor the royal herald exclaimed: "Is there no Dalberg here?" whereupon the representative of the family kneeled, and received from the new emperor the dignity of "first knight of the empire." Several members of this family have been celebrated as patrons of literature and art, of whom the most distinguished is

DALBERG, KARL THEODOR, BARON VON, Chamberlain of Worms, and archbishop of Regensburg, b. at Hernsheim, Feb. 8, 1744. He studied at Göttingen and Heidelberg, and, after some time passed in travel, devoted himself to the church. At Erfurt, of which he was appointed governor, 1772, he was active and generous as a patron of literature and art, and also contributed greatly to the social and commercial welfare of the

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little state placed under his control. After holding several high offices in the church, D. was sent to Paris (1804), in order to assist in adjusting several ecclesiastical affairs with Napoleon and pope Pius VII. He died at Regensburg, Feb. 10, 1817. D. was as highly respected as a ruler and a scholar as for his private character. During his whole life, he cultivated the friendship of those eminent in literature and art, such as Goethe, Schiller, Wieland, etc. His writings—marked by sound learning and eloquence of style—include a treatise *On the Influence of the Arts and Sciences on Social Order* (1793), and *Pericles, or the Influence of the Fine Arts on the Public Welfare* (1806). These were his favorite objects of study; but natural history, chemistry, botany, mineralogy, and agriculture, also engaged his attention.

DALBER'GIA, a genus of trees and climbing shrubs of the natural order *leguminosæ*, sub-order *papilionaceæ*, having a stalked membranous pod, which is flat, tapers to both ends, and contains 1 to 3 flat seeds. The leaves are pinnate, with a terminal leaflet. All the species are natives of warm climates. Some of them are valuable timber-trees, particularly the Sissoo of Bengal (*D. sissoo*), much prized, and more extensively used in the n. of India than any other timber-tree except the sal (q v.). *D. monetaria*, a native of Surinam, yields a resin very similar to dragon's blood.

DALE, a co. in s.e. Alabama, on the Choctawhatchee river; formerly (until divided) 660 sq.m.; pop. '90, 17,225, includes colored. It is a sandy and unproductive region. Co. seat, Ozark.

DALE, DAVID, 1739–1806; a Scottish manufacturer who secured the use of Arkwright's spinning patent, and founded the New Lanark mills, and subsequently other important establishments, becoming very rich, and noted for benevolence. Robert Owen married his daughter and succeeded him in the Lanark mills. Dale was the pastor of a church in which grew up a peculiar sect of Scotch independents who called themselves "Dalites."

DALE, RICHARD, 1756–1826; an American naval officer, who, after joining the English service in the beginning of the revolution, went over to his own country and served under Paul Jones. He was several times taken prisoner. After independence he was appointed captain, and had command of the squadron sent against Tripoli. He resigned in 1802.

DALE, ROBERT WILLIAM, D.D., b. London, England, 1829; graduated M.A. at the univ. of London, 1853. In the same year he was ordained as a Congl. minister. He was chairman of the Congregational union, 1868–69; for seven years edited *The Congregationalist;* in 1877 visited this country to deliver a series of lectures on preaching at Yale college; and is author of the following books: *Discourses on Special Occasions*, 1866; *Weekday Sermons*, 1867; *The Atonement*, 1875; *Impressions of America*, 1878; *The Evangelical Revival*, 1880, etc. His pastorate was for many years in Birmingham, where he was long a power. He had fine scholarship, strong thought, and facile speech, with lofty character; and was regarded as the most powerful popular leader of the "Liberal" cause in the midland counties. He died in 1895.

DALECAR'LIA, or DALARNÉ (signifying "valley-country"), an old province of Sweden, now forming the län or county of Kopparberg or Fahlun). The Dalecarlians are celebrated for the part they took under Gustavus Vasa in freeing their country from the yoke of Christian II. of Denmark.

DALGAR'NO, GEORGE, an almost forgotten but very able author, was b. at Aberdeen about 1626, studied at Marischal college, and afterwards kept a school in Oxford for 30 years, where he d. Aug. 28, 1687. He deserves to be remembered for two remarkable works—the *Ars Signorum, Vulgo Character Universalis et Lingua Philosophica* (Lond. 1661); and *Didascalocophus, or the Deaf and Dumb Man's Tutor* (Oxf. 1680). The former is a very ingenious attempt to represent and classify ideas by specific arbitrary characters irrespective of words. It contains the germs of bishop Wilkins' subsequent speculations on a "real character and a philosophical language." Leibnitz has repeatedly alluded to it in complimentary terms. The latter work has for its design, "to bring the way of teaching a deaf man to read and write, as near as possible to that of teaching young ones to speak and understand their mother-tongue." D. has the great merit of having anticipated, by more than 130 years, some of the most profound conclusions of the present age respecting the education of the deaf and dumb.

DALHOU'SIE, Marquis of, JAMES ANDREW BROUN-RAMSAY, Gov.gen. of India, third son of the ninth earl of D., was b. April 22, 1812, at Dalhousie castle, Midlothian. He was educated at Harrow, and graduated at Christ church, Oxford. In 1832, by the death of his only remaining brother, he succeeded to the honorary title of lord Ramsay. In 1835, he contested the representation of Edinburgh, in the conservative interest, against the Whig candidates, sir John Campbell, afterwards lord Campbell, and Mr. Abercromby. He bore his defeat with great good-humor. In 1836, he married the eldest daughter of the eighth marquis of Tweeddale; in 1837, was elected for Haddingtonshire. On the death of his father, in 1838, he succeeded to the earldom of D., and became a member of the upper house. In 1843, he was appointed, by sir Robert Peel, vice-president of the board of trade, and in 1845, succeeded Mr. Gladstone as president of the board. The "railway mania" threw an immense amount of labor and responsibility upon his department; but the energy, industry, and administrative ability he dis-

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played in his office, no less than his readiness and fluency in parliament, marked him out for the highest offices in the state. When sir Robert Peel resigned office in 1846, lord John Russell, who succeeded him, paid the earl of D. the rare compliment of asking him to remain at the board of trade, in order to carry out the regulations he had framed for railway legislation and intercommunication. In 1847, he was appointed gov.gen. of India, as successor to lord Hardinge, and arrived in Calcutta, Jan. 12, 1848 —the youngest gov.gen. ever sent to that country. His Indian administration was not less splendid and successful, in regard to the acquisition of territory, than in the means he adopted for developing the resources of the country and improving the administration of the East Indian government. Pegu and the Punjab were conquered; Nagpore, Oude, Sattara, Jhansi, and Berar were annexed—altogether, four great kingdoms, besides a number of minor principalities, were added to the dominions of the queen under his governor-generalship. Railways on a colossal scale were planned, and partly commenced; 4,000 m. of electric telegraph were spread over India; 2,000 m. of road between Calcutta and Peshawur were bridged and metaled; the Ganges canal, the largest of the kind in the world, was opened; the Punjab canal was undertaken; important works of irrigation all over India were planned and executed; and the official department of public works were reorganized. Among other incidents of his beneficent administration may be cited the permission to Hindu widows to marry again; relief to persons of all sects from the risk of forfeiting property by a change of religion; the improvement of education and of prison-discipline; the organization of the legislative council; the improved training of the civil service, covenanted and uncovenanted; and the reform in the postal service of India, whereby a letter from Peshawur to cape Comorin, or from Assam to Kurrachee, is now conveyed for three farthings, or $\frac{1}{16}$th of the old charge. These, and many other achievements of his Indian administration, will be found in a minute which he drew up on resigning office, in which he reviewed, with pardonable pride, the events of his eight years' governor-generalship. His constitution had never been strong, and it gave way under the incessant labor and responsibility imposed upon him by his noble ambition. Meanwhile, honors had been showered upon him by his queen and country with no sparing hand: in 1848, he was made a knight of the Scottish order of the Thistle; in 1849, he received the marquisate, the thanks of both houses of parliament and of the East India Company, for the "zeal and ability" displayed in administering the resources of British India in the contest with the Sikhs, immediately previous to the annexation of the Punjab; in 1852, on the death of the duke of Wellington, he was nominated by the then prime minister, the earl of Derby, to the office of constable of her majesty's castle of Dover, and lord warden of the cinque ports. D. sailed from Calcutta in Mar., 1856. On his arrival in England, he was unable to take his seat in the house of lords; and the remainder of his days was spent in much physical suffering and prostration of strength. On the 19th Dec., 1860, he died at Dalhousie castle, in his 48th year, leaving behind him a name that ranks among the highest in the roll of Indian viceroys for statesmanship, administrative vigor, and the faculty of inspiring confidence among the millions subjected to his sway. As he died without male issue, his title of marquis became extinct on his death, the earldom of D. and other Scottish honors reverting to his cousin, baron Panmure.

DA'LIAS, a t. of Spain, situated in the province of Almeria, 20 m. w.s.w. of the city of that name, and about 4 m. from the Mediterranean. It is badly and irregularly built, and is subject to earthquakes. Population in 1887, 6254, many of whom are engaged in the fisheries.

DALIN, OLOF VON, 1708–63; a Swedish poet, who, at the age of 24, began his literary career by starting the *Argus*, a journal in imitation of Addison's *Spectator*. He published a vast number of sketches, poems, etc. In 1756 he was tutor to the crown prince, and was arrested and tried on suspicion of having taken part in the attempted revolution of that year. He was acquitted, but was exiled for five years. He was afterwards ennobled and made a privy-councillor. His great work was a *History of the Swedish Kingdom*.

DALKEITH', a burgh of barony, 6 m. s.e. of Edinburgh, stands near the junction of the North and South Esk, and is a station of the North British railway. It chiefly consists of one main street. Pop. '91, 7035. It has a corn-market, a large and commodious market-hall, erected in 1854; manufactures of carpets, besides iron-foundries, tanneries, and coal-works. There are large coal mines near by. D. arose round an ancient castle, which was long a great stronghold. The regality of D. was successively held by the Grahams, the Douglases, the earls of Morton, and the earls of Buccleuch—the latter having bought it from the Mortons in 1642. During the minority of James VI., D. castle was the chief residence of the regent Morton: hence it was called the Lion's Den. Gen. Monk lived in it during his government of Scotland under Cromwell. Dalkeith palace, the chief seat of the duke of Buccleuch and Queensberry, built about 1700 on the site of the old castle, is a large square structure overhanging the North Esk, amid fine grounds, in which the two Esks flow and unite. There are about a dozen places of public worship. Besides the old parish church, there is another, a fine cruciform structure in the early English style, built (1840) and endowed by the duke of Buccleuch. An episcopal chapel stands within the palace grounds. D. possesses several good public and private schools.

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DALKISSORE', a river of Bengal proper, joins the Hoogly from the right at Diamond harbor, about 30 m. below Calcutta. It has a s.e. course of about 170 m., rising in lat. 23° 30′ n., and long. 86° 34′ east. In its lower section, the D. assumes the name of the Roopnerain.

DALLAM, a co. in n.w. Texas; formed 1876, and organized in 1891; 1468 sq. m. Pop. '90, 146. Co. seat, Texline.

DALLAS, a co. in s.w. Alabama intersected by the Alabama river and several railroads; 954 sq. m.; pop. '90, 49,350, includes colored. Co. seat, Selma.

DALLAS, a co. in central Arkansas, on Saline river; 676 sq.m.; pop. '90, 9296, includes colored. The chief productions are agricultural. Co. seat, Princeton.

DALLAS, a co. in central Iowa intersected by the Des Moines, Northern, and Western railroad; 576 sq. m.; pop. '90, 20,479. Agriculture is the chief business. Co. seat, Adel.

DALLAS, a co. in central Missouri; mostly wild land; 530 sq. m.; pop. '90, 12,647. Productions, agricultural. Co. seat, Buffalo.

DALLAS, a co. in n.e. Texas, drained by Trinity river; 900 sq. m.; pop. '90, 67,042, includes colored. Co. seat, Dallas.

DALLAS, city and co. seat of Dallas co., Tex.; on the Trinity river and the Gulf, Colorado, and Santa Fé, the Houston and Texas Central, the Missouri, Kansas, and Texas, the Texas and Pacific, and the Texas Trunk railroads; 215 miles n. e. of Austin. It is in the great grain belt of the state, and has large cotton, mining, manufacturing and commercial interests. The city contains the Roman Catholic pro-cathedral of the Sacred Heart; the Protestant Episcopal cathedral of St. Matthew; Ursuline convent and academy, St. Mary's orphanage, St. Paul's sanitarium (all Rom. Cath.); St. Mary's institute for girls (Prot. Epis.); high school; a school of fine arts; U. S. government building; merchants' exchange; Y. M. C. A.; grounds of the State fair and Dallas exposition; electric light and street railroad plants; extensive sewerage system; waterworks on the pump and reservoir system, supplemented by an artesian well; many miles of streets macadamized or paved with *bois d'arc;* and several public parks. The business interests are represented by about 12 national and state banks, cotton and woolen mills, grain elevators, flour mills, meat-packing plant, lumber and planing mills, cotton compress, cotton seed oil mill, nurseries, etc. Pop. '90, 38,067.

DALLAS, ALEXANDER JAMES, 1759–1817; born in the island of Jamaica, died in Trenton, New Jersey; a lawyer of Pennsylvania and author of reports on law cases and decisions. He was the projector of the United States bank at the time when the nation was in great trouble about currency to carry on the war with England. He was also secretary of the treasury, and acting secretary of war, superintending the reduction of the army after peace.

DAL'LAS, GEORGE MIFFLIN, an American statesman and diplomatist, was b. at Philadelphia, July 10, 1792. He was educated at Princeton college, and accompanied Mr. Gallatin in his special embassy to St. Petersburg as private secretary. On his return, he resumed the practice of the law, and successively filled the offices of deputy of the attorney-general of Philadelphia, mayor of Philadelphia, and district-attorney of Philadelphia. In 1831, he represented Pennsylvania in the senate of the United States, but after two years retired, and resumed his profession. In 1837, he was appointed American minister at St. Petersburg, but was recalled in 1839. In 1844 he was elected vice-president of the United States, and held this office until 1849. In 1856 he succeeded Mr. Buchanan as American minister at the court of St. James. He was empowered to settle the Central American question; but shortly after his arrival, a dispute between the two governments, arising out of the dismissal of Mr. Crampton, the British minister at Washington, by the president of the United States, threatened to bring the diplomatic mission of D. to a premature termination. Through the forbearance of lord Palmerston, he was, however, permitted to remain, and discharged the duties of American minister until 1861, when he was succeeded by Mr. C. F. Adams. He died in 1864.

DALLES, romantic and perilous rapids on the Columbia or Oregon, form, along with the chutes above them and the cascades below them, an almost continuous interruption between the tide-water of the river and its long reach—about 400 m. —of comparatively practicable navigation towards the interior. They are subdivided, reckoning downwards, into the Little D. and the D. proper. On the latter, the basaltic rocks, which, from a considerable distance above, bound the channel, suddenly confine the stream to one third of its width, with a perpendicular wall on either side.

DALLES CITY, or the DALLES, city and co. seat of Wasco co., Ore., on the Columbia river, 85 m. e. of Portland. It is a shipping point for grain, stock, and wool. Pop. '90, 3029.

DALLING AND BULWER, Baron. See BULWER, SIR HENRY LYTTON.

DALL' ONGARO, FRANCESCO, 1808–73; an Italian poet and dramatic author. He aided in organizing the Garibaldi legion in Rome, and became noted as a writer of works of fiction.

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DALMA'TIA, a narrow strip of territory, extending along the Adriatic sea, and bounded on the n. by Croatia, on the e. by Bosnia, Herzegovina, and Montenegro. Lat. 42° 15′ to 44° 54′ n., long. 14° 30′ to 19° e. It forms, with its adjacent islands, the most southern crownland of the Austrian empire. Area, 4,940 sq. m.; pop. '90, 527,426. The coast of D. is everywhere steep and rocky, and the adjacent series of islands, divided by picturesque straits and channels, are of a like character. Numerous bays intersecting the coast form excellent havens and landing-places. Offsets from the Dinaric Alps traverse the interior, and attain in Mt. Orien, the highest culminating point, an elevation of 6,332 ft.; the Velebich mountains, separating D. from Croatia, and which belong to the Julian Alps, have a height of more than 5,000 ft. The mountains of D., for the most part composed of limestone, present a bleak and barren aspect, with many romantic chasms and fissures, through which dash impetuous mountain-streams. The chief rivers —none of which, however, are of any importance—are the Zermagna, Kerka, Cettina, and Narenta, the second and third of which are broken in several places by beautiful cascades and falls. The lakes are numerous, but, with the exception of Lake Vrana—which is separated from the Adriatic by only a narrow tongue of land, and the waters of which are brackish—they are periodical, drying up in summer, and filling their beds in late autumn. A large part of the whole area of D. consists of moor and morass, yet in summer there is often a great scarcity of water. The climate is in general warmer than that of any other part of Austria, the African sirocco being occasionally felt on its shores. The minerals are limestone, coal, gypsum, etc. Agriculture is in a backward state. About 18 per cent. of the land is arable, and produces wheat, barley, oats, maize, rye, and potatoes. Wine and olives are also produced. More than half of the land is in pasture, and wood occupies about a fifth. The islands are not very fertile, but supply good timber for shipbuilding. Cattle-rearing, seafaring, and the fisheries on the coast are the chief kinds of industry. The great majority of the inhabitants belong to the Roman Catholic church, but there are many Greek Christians as well as some Protestants and Jews. Slavs make up the bulk of the population, but the Italians are numerous on the coast. D. is represented by nine members in the Austrian Reichsrath, and has a provincial diet of 43 members, with power to legislate in local affairs, such as taxation, agriculture, educational and religious institutions and public works. The Dalmatians are a fine race of men—bold and brave as seamen and soldiers—and formerly were the main support of the military power of Venice. But it must be added that they are deceitful and rapacious, while the love of independence is extreme. They speak the Illyrian-Servian or Herzegovinian dialect; but the language used in the government offices, especially in Spalatro, is the Italian. The Morlaks—who inhabit the interior, the mountainous district, and the Turkish sanjak of Hersek—are also good soldiers, hospitable and faithful to their engagements, lovers of independence, but it is said they are addicted to robbery and drunkenness. D. is divided into four circles—Zara, Spalatro (or Spalato), Ragusa, and Cattaro. These are also the names of the chief towns.

In ancient times, D. was a considerable kingdom, and, after many unsuccessful attempts, was first subjugated by the Romans in the time of Augustus. After the fall of the western empire, D., which had formed the most southern part of the province Illyricum, was captured by the Goths, from whom it was taken by the Avari (490), who in their turn yielded it to the Slavonians about 620. The state founded by the Slavonians continued until the beginning of the 11th c., when king Ladislaus of Hungary incorporated a part of D. with Croatia, while the other part, with title of duchy, placed itself under the protection of the Venetian republic. The Turks afterwards made themselves masters of a small portion; and by the peace of Campo-Formio (1797), the Venetian part of D., with Venice itself, became subject to Austrian rule; and when Austria, in 1805, had ceded this part of D. to Napoleon, it was annexed to the kingdom of Italy; afterwards (1810) to Illyria. Since 1814, D. forms part of Austria; the commune of Spizza being added by the congress of Berlin in 1878.

DALMAT'IC (*dalmatica*), the deacon's robe, in the Roman Catholic church. It was originally of linen, but it is now generally made of the same heavy silk as the planeta (q.v.), worn by the priest.

DAL'RIADA, the ancient name of a territory in Ireland, comprehending what is now called "the Route," or the northern half of the county of Antrim. It signifies primarily, "the race of Riada;" and secondarily, "the country of the race of Riada," i.e., Cairbre Righfada, or "Cairbre of the Long Arm," the son of a chief or prince of the Scots in Ireland, and himself a warrior of note. He lived in the 3d c., and not only obtained an ascendency in the district of Ireland which came to be called after him, but, according to some writers, planted a colony of his Scottish countrymen on the shores of Argyleshire in Alba, or Albany, as Scotland was then called. It is certain that about 506 A.D. some of his descendants, led by Loarn, Fergus, and other sons of Eirc, son of Muinreamhar, passed over to Argyleshire, where they settled themselves permanently, and founded the kingdom of "Dalriada in Albany," or "the Scots in Britain." More than twenty kings of this state are enumerated before Kenneth MacAlpin, who, about 843, united under one scepter the Dalriads, or Scots, and the Picts, and thus became the first king of Albany, which about two centuries afterwards began to be known as Scotia or Scotland.

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DAL'RIADS, or DALREUDI'NI, the inhabitants of Dalriada (q.v.).

DALRY', a t. of Ayrshire, Scotland, on the Garnock, near the mouth of the Rye, 20 m. s.w. of Glasgow; it is a station on the Glasgow and South-western railway. The vale of the Garnock is naturally beautiful and fertile; but its mineral wealth in coal, lime, and iron has caused a great change in its aspect, and it is much disfigured by blast-furnaces, etc., and by vast heaps of refuse from mines. D. was formerly a small village, but has become of importance in consequence of the establishment of iron-works at and near it. It has coal mines, worsted and woolen mills, and in the neighborhood are the iron works of Glengarnock and Blair. Pop. '91, less than 5000.

DALRYM'PLE FAMILY, a very old and illustrious Scottish family, deriving its name from the lands of Dalrymple in Ayrshire. The principal members are:

DALRYMPLE, JAMES, VISCOUNT STAIR, a lawyer and statesman, son of a small proprietor in Ayrshire, was b. at Drummurchie, in the same county, May, 1619, educated at Glasgow university, and at an early age, entered the army raised in Scotland to repel the religious innovations of Charles I. But the bent of his mind lay towards civil and literary pursuits; and in 1641, he was appointed professor of philosophy at Glasgow. The use which he made of philosophy, however, was rather to aid him in basing law—his favorite study—on profound and comprehensive principles, than to add another metaphysical system to those already in existence. In short, his wish was to be a philosophic lawyer, rather than a philosopher. In 1648, he entered as an advocate at the Scotch bar, where he rapidly acquired great distinction; in 1649, and again in 1650, he was appointed secretary to the commissioners sent to Holland by the Scottish parliament to treat with Charles II.; and in 1657, was induced—but with difficulty—to become one of the "commissioners for the administration of justice" in Scotland under Cromwell's government. Dalrymple was a conscientious, but at the same time an exceedingly moderate and enlightened royalist; and although appointed one of the new Scotch judges after the restoration, he resigned his seat in 1663, because he could not take the "declaration" oath, which denied the right of the nation to take up arms against the king. His great talents, however, induced the monarch to accept his services on his own terms. Dalrymple was now created a baronet. In 1671, he became lord president of the court of session. As a member of the privy council he was invariably the advocate, though not always successfully, of moderate measures. In 1681, when the infamous "test" oath was under consideration, Dalrymple, with the dexterity of a lawyer, caused John Knox's confession of faith to be introduced as a part of the test; but as this confession inculcated resistance to tyranny as a duty, the one half of the test contradicted the other. Dalrymple's private conscience, however, was more fastidious than his public one, for he himself refused to take the very oath which, by his ingenuity, he had virtually deprived of its despotic character, and in consequence had to resign all his appointments. Before this, he had published the *Institutions of the Law of Scotland*, which is still the grand text-book of the Scotch lawyer. The disquisitions are both profound and luminous, characterized alike by their philosophic insight and their sound common sense. After some time spent on his estate in Wigtonshire, Dalrymple went to Holland in 1682, to escape the persecution to which he was subjected at home. During 1684–87, he published at Edinburgh—though he himself was then residing at Leyden—his *Decisions;* and in 1686, at Leyden, a philosophic work in Latin, entitled *Physiologia Nova Experimentalis*. He accompanied the prince of Orange on his expedition to England. When matters were prosperously settled, William re-appointed him lord president of the court of session, and elevated him to the peerage under the title of viscount Stair. He died 25th Nov., 1695.

DALRYMPLE, JOHN, b. in 1648, eldest son of the preceding, held office under James II. and William III. While secretary of state for Scotland, he incurred great odium on account of his share in the barbarous transaction known as the "massacre of Glencoe." In 1703, he was elevated to the earldom of Stair. He died in 1707.—Sir JAMES DALRYMPLE, second son of viscount Stair, was the author of *Collections concerning Scottish History preceding the Death of David I.* (1705), and the grandfather of sir John Dalrymple of Cranstoun, author of *Memoirs of Great Britain and Ireland, from the Dissolution of the last Parliament of Charles II. until the Sea-battle off La Hogue.*—The other sons—Viscount Stair had altogether nine children, five sons and four daughters—were more or less distinguished.

DALRYMPLE, JOHN, second son of the first earl of Stair, and grandson of viscount Stair, was born at Edinburgh, July 20, 1673. He had the misfortune, while young, to kill his elder brother, by the accidental discharge of a pistol. This unhappy circumstance induced the parents, both for their own comfort and that of the boy himself, to educate him away from home. He was placed under the care of a clergyman in Ayrshire, who, by his prudence and kindness, soon developed the excellent qualities of the youth. Dalrymple afterwards went to Leyden, where he had the reputation of being one of the best scholars in the university. He completed his curriculum at Edinburgh. In 1701, he accepted a commission as lieut.-col. of the Scottish regiment of foot-guards, and gained the highest distinction in Marlborough's campaigns. When the accession of the

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tory ministry, in 1711, put a stop to the brilliant career of the great duke, Dalrymple retired from the army. When George I. succeeded to the throne, Dalrymple—who had become earl of Stair by the death of his father in 1707—was made a lord of the bed-chamber, a privy-councilor, and commander-in-chief of the forces of Scotland. Next year, he was sent as ambassador to France, in which capacity he exhibited the highest ability, and was of the greatest service in traversing the schemes for the reinstatement of the pretender; but as he refused to flatter his countryman, Law—notorious in connection with the fatal Mississippi scheme—who was then omnipotent in France, the government was mean enough to recall him. For 22 years he lived in retirement at Newliston, near Edinburgh, devoting himself chiefly to agriculture, which was then bgeinning to improve in Scotland. He was the first to plant turnips and cabbages in the open fields. In 1742, he was sent as ambassador to Holland, and in the following year served under George II., at the battle of Dettingen. Later, he was made commander-in-chief of the forces of Great Britain. He died in 1747. See *Annals, etc., of the Viscount and Earls of Stair*, by J. M. Graham (1875).

DALRYMPLE, SIR DAVID, a Scottish judge and historical antiquary, commonly known as lord Hailes, was b. at Edinburgh, 28th Oct., 1726. He was the grandson of sir David Dalrymple, youngest and reputedly the ablest son of viscount Stair. He was educated first at Eton, afterwards at Edinburgh, and finally at Leyden, whence he returned to Scotland in 1746. In 1748, he was called to the Scottish bar, where his success was highly respectable, but not astonishing. D. was a man of extensive culture and classical tastes, of sound judgment, and great industry, but a very indifferent orator; and, in consequence, men of far inferior powers often acquired a greater reputation and a more lucrative practice. In 1766, he was appointed one of the judges of the court of session, and assumed the title of lord Hailes, by which he is chiefly known to posterity. His accuracy, diligence, judicial impartiality, and dignified demeanor, secured him the highest respect in his new office. Ten years after, he was made a justiciary lord. He died 29th Nov., 1792.—Although D.'s official duties were very arduous, he found time to compose numerous works, surpassing in value those of many men whose lives have been wholly devoted to literature. We can afford to mention only a few. *A Discourse on the Gowrie Conspiracy* (1757); *Memorials and Letters relating to the History of Britain in the Reign of James I.* (1762), a curious and interesting volume; *The Works of the ever-memorable John Hailes of Eton, etc.* (1765); *Memorials and Letters relating to the History of Britain in the Reign of Charles I.* (1766); *Annals of Scotland from the Accession of Malcolm III., surnamed Canmore, to the Accession of Robert I.* (1776); and *Annals of Scotland from the Accession of Robert I., surnamed the Bruce, to the Accession of the House of Stuart* (1779). Besides these, D. wrote works on legal antiquities and ancient church history, edited old Scotch poems, and published sketches of the lives of various notable Scotchmen, as specimens of how a *Biographia Scotia* might be executed.

DALRYMPLE, ALEXANDER, F.R.S., F.S.A., younger brother of the preceding, was b. at New Hailes, the seat of his father, near Edinburgh, 24th July, 1737. In 1752, he obtained an appointment in the East India company's service; but his extreme youth, as well as the imperfect education he had received at home, rendered it necessary, on his reaching Madras, that he should be placed under the store-keeper for a time. Lord Pigot himself, at that time governor of the presidency, condescended to give him lessons in writing; but young D. having, unluckily for his own prospects, fallen upon some papers in the secretary's office relating to the commerce of the Eastern archipelago, became so engrossed with the importance of the subject, that, after some bickerings with his superiors, he relinquished his appointment, and made a voyage of observation among the eastern islands. At Sooloo, in the course of his expedition, he concluded a commercial treaty with the sultan, which might have led to beneficial results; but on his return in 1762, he found political affairs entirely changed, small-pox raging, and most of his influential friends dead. The scheme, in consequence, proved a failure. In 1765, he returned to Britain, to urge its importance on the home-authorities, but did not succeed. In 1775, however, he was sent out to Madras as a member of council, but was recalled in two years, apparently without good reason, for in 1779 he was appointed hydrographer to the East India company, and shortly after received a pension. In 1795, when the admiralty resolved to establish a similar office, it was conferred on D., who held it till within a short period of his death, which occurred 19th June, 1808, at Marylebone, London. D. wrote a vast number of letters, pamphlets, etc., containing plans for the promotion of British commerce in various parts of the world, political dissertations, accounts of geographical expeditions, etc.

DALTON, city and co. seat of Whitfield co., Ga., on the Southern and the Western and Atlantic railroads; in a beautiful valley surrounded by mountains; 100 miles n. w. of Atlanta. It was a place of strategic importance during the civil war. Exports, cotton, grain, and fruits, iron, manganese and limestone. Pop. '90, 3046

DALTON, JOHN, was b. Sept. 5, 1766, at Eaglesfield, near Cockermouth, in Cumberland. He received his early education in the school of his native place, and, after 1781, in a boarding-school kept by a relative in Kendal. Here his love of mathematical and physical studies was first developed. He wrote several mathematical essays, and in 1788 commenced a journal of meteorological observations, which he continued throughout his whole life. In 1793 he was appointed teacher of mathematics and the physical

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sciences in the new college at Manchester, where he chiefly resided during the remainder of his life, though frequently employed, after 1804, in giving lectures on chemistry in several large towns. In the years 1808–10, he published his *New System of Chemical Philosophy*, 2 parts (Lond.), to which he added a third part in 1827. In 1817, he was appointed president of the literary and philosophical society at Manchester. He was also a member of the royal society, and of the Paris academy, and, in 1833, received a pension of £150, afterwards raised to £300. In the same year, D.'s friends and fellow-townsmen collected £2,000, to raise a statue to his honor, which was executed by Chantrey, and placed at the entrance of the royal institution in Manchester. D. was also honored by the university of Oxford with the degree of D.C.L., and with that of LL.D. by the university of Edinburgh. He died, universally respected, at Manchester, July 27, 1844. His chief physical researches were those on the constitution of mixed gases, on the force of steam, on the elasticity of vapors, and on the expansion of gases by heat. In chemistry, he distinguished himself by his progressive development of the atomic theory (q.v.), as also by his researches on the absorption of gases by water, on carbonic acid, carburetted hydrogen, etc. His treatises are mostly contained in the *Memoirs of the Literary and Philosophical Society of Manchester*, the *Philosophical Transactions*, Nicholson's *Philosophical Journal*, and Thomson's *Annals of Philosophy*. Besides these, we have his *Meteorological Essays and Observations* (Lond. 1793; 2d ed. 1834). D. was unquestionably one of the greatest chemists that any country has produced. Profound, patient, and intuitive, he had precisely the faculties requisite for a great scientific discoverer. His atomic theory elevated chemistry into a science. In his habits, D. was simple; in his manners, grave and reserved, but kindly, and distinguished by his truthfulness and integrity of character.

DALTON, JOHN CALL, b. Mass., 1825; graduated at Harvard, 1844; and at medical school, 1847. He was prof. at Buffalo, '51–54; Vt. Med. Coll., '54–'57; L. I. Hosp., '59–61; prof. of the Col. Phys. and Surg., 1855; and surgeon in the U. S. army, 1861–64. He made many contributions to medical science. Among his publications are *Treatise on Human Physiology* (1859), *Topographical Anatomy of the Brain* (1885), etc. He d. in 1889.

DALY, AUGUSTIN, was born at Plymouth, N. C., in 1838, and educated at Norfolk and in the public schools of New York city. He was dramatic editor of the *Sunday Courier* in 1859 and held similar positions on the *Times*, *Sun*, *Express*, and *Citizen*, until 1869, when he opened the Fifth Avenue Theatre, at that time situated in 24th street. On the destruction of this theatre by fire in 1873, he opened a theatre formerly known as the "Globe" on Broadway. In 1879 he opened his present theatre on Broadway near 30th street. Mr. Daly has several times gone with his whole company to California, England, and to Germany and France. He has written many adaptations from German and French plays, one of his earliest efforts being an adaptation of Mosenthal's *Deborah*, in 1862. He wrote and adapted *Divorce*, *Pique*, *Under the Gaslight*, *The Railroad of Love*, *Seven-Twenty-Eight*, *The Great Unknown*, *Love on Crutches*, and *The Last Word* (1890). Mr. Daly is especially noted for excellence in scenic presentation, and his Shakespearian revivals have received warm praise both in this country and in England. In 1894 he was presented with the Laetare medal of the University of Notre Dame, Ind. He made a remarkable collection of plates on Biblical subjects.

DALY, CHARLES PATRICK, LL.D., b. New York city, 1816; for many years a leading jurist, being chief-justice of the court of common pleas. He has published *History of the Courts of New York*, and many legal papers of importance. He is president of the American geographical and statistical society. He retired from the bench 1885.

DAM, TINKER'S, a guard of dough or clay placed by a tinker around a cavity to confine the melted metal until it "sets." It is worthless after use.

DAM (Fr., *barrage*), a barrier for raising the level of water in a stream, for the purpose of forming a reservoir, or for turning the water in another direction. Several dams are sometimes placed upon a water-course for the purpose of preventing too rapid an escape of water where it is needed for irrigation or for moving machinery. There is also a variety of dam called a coffer-dam, in which an inclosure is bounded by a barrier which prevents exterior water from entering, used generally for the purpose of excavation. Dams constructed for raising the level of water have an important use in the slack-water navigation of rivers. The materials which enter into the construction of dams differ according to circumstances. If the structure be required to bar a narrow gorge and a considerable stream, it must be made very strong, not only to withstand the hydrostatic pressure, but also the force of the current, which often, during freshets, becomes very great. The materials are then generally composed of a combination of wood-work and masonry. Masonry may be principally used when the gorge is so narrow as to allow of the construction of a sufficiently small horizontal arc to resist the pressure. When the dam is very long (across a wide stream), unless a vast amount of stone is used, wooden braces must be employed. Where the body of water to be restrained is not more than 4 or 5 ft. deep and the bottom is firm, a clay or stiff loam embankment 9 or 10 ft. thick, well compacted, will answer the purpose if a gate be provided to keep the water from flowing over the top of the embankment, which would

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cause it to wear away. It is not always economy to build the dam in the narrowest part of a stream, or where the opposite banks nearest approach each other. This will often cause during a freshet too great a depth of running water over the dam, by which it may be endangered. A point should be selected where the dam can be made of sufficient width to allow the water to pour over it without piling up too much, and where the foundation is good. The line of a dam may be transverse or diagonal to the flow of water. The diagonal is sometimes of advantage in increasing the width of flow, but is liable to interfere with the bed of the stream below more than the transverse line. Where practicable, the form of an arc, the convexity fronting up stream, is the best; but a broken line may sometimes be employed to advantage, the angles pointing up stream acting as braces, while the angles pointing down stream may be held by natural rock formation or heavy masonry, strengthened by bracing. There are a great many large dams in the manufacturing districts of New England, and in freshets, the giving way of some of them through faulty construction, has caused great destruction.

An example of a well-constructed dam is at Holyoke, Mass., across the Connecticut river. It is 1017 ft. long and 30 ft. high. The braces are formed of large square timbers inclined 23° from the horizontal, with the lower ends bolted in the rock, and the upper ends sustaining timber frame-work. The canal for delivering the water, which is received by thirteen gates, is faced with masonry, and is 144 ft. wide at the top, and 23 ft. deep. It is said to be the best water motive-power utilized in the United States. A remarkable dam exists across the river Furens, in France, for protecting the town of St. Etienne from freshets, and also for supplying the town with water. It is 164 ft. high, and 328 ft. wide at the top. The excavations for the foundation were very great and expensive, and the dam was constructed entirely of masonry, the stone laid not in tiers, but so as to produce a unity of mass, and with hydraulic cement, which is the mortar always used. The pressure of the contained water, at the depth of 154 ft., as much as 67 lbs. to the square inch, has sometimes been sufficient on this dam to force water through the pores of the material. In India, dams are constructed for purposes of irrigation, and some of them are of enormous magnitude. One of the longest is on the Godavery river at Dowlaisweram. Its total length is 4,872 feet.

A good example of the mode of constructing a coffer-dam under great difficulties, on account of quicksand bottom, was furnished in the work preliminary to the building of the dry-dock at the Brooklyn navy-yard. There was over 60 ft. of utterly unstable micaceous sand below the mud at the bottom of the river. This of course, under so great pressure, would flow almost like water itself. The area required to be excavated through this material was over two acres at the top and one acre at the bottom, which was 37 ft. below mean high water. The first attempt was a failure, and longer and stronger piles were then used, filled between with stone and coarse gravel. There were six concentric rows of piles, the walls being over 60 ft. thick.

Where the bottom does not admit of pile-driving, crib-work, weighted with stone and sunk in proper position, is used, the crevices being stopped with hydraulic cement. At Blossom Rock, in San Francisco harbor, a combination of crib-work and iron cylinder was used in the construction of the coffer-dam by means of which the excavations were made, preparatory to blasting. An iron cylinder 6 ft. in diameter, armed with thick india-rubber flaps at the bottom, was sunk to the ground and then surrounded with crib-work. Excavation was then made within the cylinder, which was from time to time depressed until the depth was reached necessary to exclude the water. See illus., ENGINEERING, vol. V.

DAMAGES, in law, are the pecuniary recompense claimed on account of suffering an injury through the act of another. The peculiar constitution of the English common-law courts, which, till lately, prevented them in most cases from giving any other remedy than by way of D., rendered the questions relating to this subject of unusual importance; but the progress of recent legislation has been in the direction of restricting actions for D. to the cases in which the restitution of property or enforcement of a right cannot be otherwise attained. The court of chancery, on the other hand, could not give D., it could only enforce performance of an obligation by personal restraint, and hence, according to the nature of the remedy desired, the suitor resorted to the one or other court. In Scotland, the supreme court has always been able to give redress in either way.

Where a sum ascertained in amount is due, the action is one not properly for D., but of debt. But where the sum is not ascertained, as where an injury has been done to a man's character or property, the action in either country can in general only be for D., the amount of which the injured party estimates, and which is determined by the judgment of the court, or verdict of a jury, subject to certain fixed rules which the courts have laid down, as the principle according to which the estimation is to be made. These, it is obviously impossible to detail here, and reference must be made to the title of the special subjects out of which a claim may arise for such information as it is practicable to give. It may be observed, however, that it is a general rule to restrict the amount of D. to that of the actual pecuniary loss, wherever it can be ascertained; and that neither in Scotland nor England will a stipulated penalty for breach of agreement be accepted as determining the sum due for D., unless it shall appear, by the use of the

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term "as liquidated damages," or some equivalent expression, that both the parties had intended to fix conclusively the sum payable in case of default. Other general rules are, that the injury for which D. are claimed must have affected the claimant individually, and not merely as one of the general public, although it is not essential that the injury should have done material hurt to him, as this only affects the amount of damages. And the injury suffered must have been the direct and immediate consequence of the act done; if it has only been a secondary or remote result of the act, no D. will be given. And any act sued on must be an actual injustice; it is not enough that it produces disadvantageous results, if these arise only from doing what the party was justified in doing. D., therefore, may be sued for in respect of a crime involving liability to criminal punishment; but in England, in the case of a felony, no action for D. will lie against the offender, because it is the duty of the complainant to prosecute him criminally. It is otherwise, however, in the case of misdemeanors; an action for D. is there independent of criminal proceedings. In Scotland, this is the rule in reference to every species of crime. The principles are general, and substantially the same in all countries. The chief principle is to give compensation for some right violated. There is necessarily a wide margin for opinion and judgment in all such cases, depending largely upon agreements and fortuitous conditions and circumstances. In general, damages are compensatory only, but in some cases they are punitory or exemplary.

DAMAN', an outlying portion of the Punjab, runs about 300 m. along the right or w. bank of the Indus, extending back, with an average breadth of about 60 m., as far as the Suliman mountains. It stretches in n. lat. from 28° 40′ to 33° 20′, and in e. long. from 69° 30′ to 71° 20′. In the absence of irrigation, the district in general is little better than a plain of smooth, bare, hard clay—the result of alternate inundation and evaporation. But when duly irrigated, this baked and burned surface becomes very productive, more especially in the strip of land—known as the Derajat—which is nearest to the bordering stream.

DAMAN, or DAMAS, a seaport and district on the w. coast of India, belonging to the Portuguese. It stands at the mouth of the Daman Gunga, or Daman river, which rises in the Syadree mountains, as the upper extremity of the western Ghauts is called by the natives, in lat. 20° 11′ n., and long. 73° 42′ east. Common spring-tides give at least three fathoms on the bar, while outside is a roadstead of more than double that depth. The harbor affords good shelter from the s.w. monsoon, and, as the neighborhood is well stocked with suitable timber, the people are largely employed in the building and repairing of ships. The peculiar drawback of the locality is the scarcity, or rather the want, of fresh water. The river, even when swollen by the rains into an inundation, is brackish, and the wells likewise are so in some degree. The place is fortified with a rampart and bastions, and it is described as having been, before the arrival of the whites, "a town great and strong." Area of district, 82 sq. m. Pop. about 49,000.

DAMAN, *Hyrax*, a genus of quadrupeds, highly interesting as a connecting link between the *rodentia* and the *pachydermata*. On account of their small size, their thick fur, and their general appearance, they were always ranked among the former, till Cuvier pointed out their essential agreement, in dentition and anatomical characters, with the latter, and assigned them a place next to the elephant and the rhinoceros, remarking, that "excepting the horns, they are little else than rhinoceroses in miniature." He adds that "they have quite similar molars, but the upper jaw has 2 stout incisors curved downwards, and, during youth, 2 very small canines, the lower jaw 4 incisors without any canines." The skull, also, and other bones of the head, resemble those of the pachyderms. The muzzle is short; the ears, short and round. The ribs are more numerous than even in the pachyderms—21 pair, a number exceeded in no quadrupeds except the sloths, whereas no rodent has more than 15 pair. The toes are united by the skin to the very nail, as in the elephant and rhinoceros, and are round and soft, merely protected in front by a broad nail, which does not reach the ground. The legs are short. The tail is a mere tubercle. There are several species of this genus, natives of Africa and of the s.w. of Asia. The SYRIAN D. (*H. Syriacus*) is now generally believed to be the *shaphan* of the Old Testament, the *cony* (q.v.) of the authorized English version. The D. is common in Syria and Palestine, inhabiting rocky places, and sheltering itself in the holes of the rocks, but not burrowing, for which its feet are not adapted. It is a timid, harmless creature, quick and lively in its movements, completely herbivorous, easily domesticated, and, in confinement, readily eating bread, roots, fruits, and herbs. It is about 11 in. long, and 10 in. high; brownish-gray above, white beneath, the thick hair interspersed with long scattered bristles.

DAMAR', a t. of Yemen, Arabia, pleasantly situated on an elevation about 120 m. n.n.w. of Aden. It is the residence of a governor, and has a college attended by several hundred students.

DAMARALAND, the northern part of a German protectorate in West Africa, coast extending from the mouth of the Kunene river to Walfisch bay, inland to 21° e. long. The coast is infertile and desolate; inland there are richer tracts. Ovampoland is partly within this territory. This region was occupied by the Boers, but later all rights ceded by the natives were acquired by the German Southwest Africa Colonial Company. Another company, an Anglo-German syndicate, formed in London, 1892, received from the German government a right to work mines in Damaraland, outside of the region occupied by the former company. Complaints having been made that too much favor

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had been shown to the Anglo-German syndicate, the government decided to reserve part of the territory for German settlers for ten years. The area and population of D. are variously estimated. The *Statesman's Year Book* for 1897 places the area of German Southwest Africa at 320,000 sq. m., and the pop. at 200,000. Damaraland proper has about 200,000 sq. m., with a pop. of 100,000 (1891).

DAMASCE'NUS, JOANNES, the author of the standard text-book of dogmatic theology in the Greek church, was b. at Damascus about 700 A.D. On account of his eloquence, he was surnamed *chrysorrhoas* ("Golden Stream"). In 730, he became a monk in the convent of St. Saba at Jerusalem, where he spent the rest of his days in the composition of theological works. He died about 756 A.D., and had the honor of being canonized by both the Latin and Greek churches. D. was a man of extensive erudition, and was considered the ablest philosopher of his time; but the word "philosopher" must have meant something very different in those days from what it does now, as D.'s writings are characterized by weakness of judgment and want of critical power. The best edition is that of Le Quien (2 vols., Paris, 1712).

DAMASCE'NUS, NICOLAUS, a Greek historian of the time of Augustus and Herod the great, with whom he was on terms of intimacy. His principal work was a universal history in 144 books, of which only a few fragments remain. He also wrote an autobiography, in which much may be learned of the lives of Augustus and of Herod.

DAMAS'CIUS, a philosopher b. at Damascus about the middle of the 6th century. He taught philosophy in Athens in the time of Justinian. There remains of his works only *Difficulties and Solutions of First Principles.*

DAMAS'CUS (Arabic, *Dimishkesh-Shâm*), a city of Syria, the largest in Asiatic Turkey, occupies a situation of unrivaled beauty on a luxuriant plain at the eastern base of the Anti-Libanus, and 53 m. e.s.e. of Beyrout, which forms its port, lat. 33° 27′ n., long. 36° 23′ east. The appearance of the city from a distance is beautiful in the highest degree. The bright buildings, sparkling beneath a Syrian sun, rise out of a sea of various tinted foliage, while all around—save on the n.w., where stretches the long bare snow-white ridge of the Anti-Lebanon—extend charming gardens, rich cornfields, and blooming orchards, with the river Barrada (the Abana of Scripture) and its branches winding through until they lose themselves far to the e. in the lake Bahr-el-Merj, into which the Phege (the Pharpar of Scripture), a smaller stream, also flows. As in the case of all eastern cities, the expectations excited by a distant view of D. are by no means realized on a close inspection. The city proper is about 6 m. in circumference, and is partly surrounded by old tumble-down walls, portions of which date from early Roman times, while other parts are of Saracenic architecture, and some mere mud-patches of the present day. The streets generally are dirty and decayed, and so very narrow that a loaded donkey almost entirely blocks up the passage. The best street is "Straight street," mentioned in the Acts of the Apostles in connection with St. Paul. The houses for the most part are very mean-looking structures, often presenting to the street nothing but a dead-wall with a doorway in it, while the best have rough mud-walls, with a projecting upper story extending so far over the narrow street that hands may be shaken from opposite windows. But as the interior of the city presents a sad contrast to its charming surroundings, so do the rich interiors of the houses contrast with their miserable externals. Fine marble-paved courts ornamented with trees, shrubs, and fountains, rooms with arabesqued roofs and walls, most luxuriously furnished, are the common features of all the dwellings of the wealthier classes. The principal buildings of D. are places of worship, chief of which is the Great Mosque—formerly a heathen temple, then a Christian church—composed of different kinds of architecture, and occupying a quadrangle 163 yards by 108 yards, the interior dimensions being 431 ft. by 125. The floor is of marble tesselated, and covered with Persian carpets, and the walls and piers of the transept are enriched with beautiful devices formed of various colored marbles, while rows of noble Corinthian pillars divide the interior into nave and aisles. Altogether, this is one of the handsomest ecclesiastical buildings of which Mohammedans can boast. The citadel is large and imposing, but not strong; and the Great Khan is a splendid building, erected of black and white marble. There are many interesting remains of antiquity in D., but they are lost amid the mean modern structures and the bazaars. The latter are numerous, and finer than those of Cairo or Constantinople, and very well supplied with goods of oriental manufacture; each class of goods having a bazaar for itself. The manufactures of D. used to be important, consisting of silks, cottons, coarse woolen cloth, jewelry, saddlery, and arms, but they have greatly declined. Before 1860, her looms were reckoned at 3,000. The manufactures of the famous Damascene blades have long ceased to exist. This decline is chiefly caused by the taxation upon raw products. The trade with Bagdad was large; but in 1857 the caravan was plundered on its way across the desert, the loss to the merchants of D. being estimated at $200,000. This paralyzed the commerce. The annual caravan to Mecca from D. at one time consisted of some 50,000 or 60,000 persons, most of whom engaged to some extent in trade; but the facilities which in recent years have been afforded for making the pilgrimage by way of Egypt and the Red sea, have caused considerable diminution in the pilgrims, and consequently in the trade. One of the greatest blows at the prosperity of D. was struck in 1860, when the Druses (q.v.) entered the city, and destroyed about 6,000 houses in the Christian quarter, killing from 3,000 to

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5,000 persons, and selling many of the women into Turkish harems. There is still a large export trade in grain, apricots and other fruits, wool and hemp, and there is a large importation of European products. In 1889, gas and tramways were introduced into the city, and a railway connecting D. with Mezerib, 70 m. distant, was finished in 1894. In 1896 a mountain railway between D. and Beirut was completed. Pop. in 1891 was estimated at 210,000, of whom about 180,000 were Mohammedans.

D. is perhaps the most ancient city in the world. Josephus attributes its foundation to Uz, the great-grandson of Noah; but whether it dates so far back or not, it is certain that it was a place of consequence in the days of Abraham. During the time of the Hebrew monarchy, it was the capital of Syria. It afterwards passed successively under the rule of the Assyrians, Persians, Macedonians, Romans, and Saracens; and finally, in 1516, it was captured by the Turks under sultan Selim I.—in whose hands, with the exception of a short interval (from 1832–40), when it belonged to the pasha of Egypt, it has remained ever since. Under every change of dynasty and every form of government, D., unlike most cities, has retained its prosperity.

The vilayet of D. comprises all the territory between the Lebanon and the Euphrates —that is, all between lat. 31° to 36° n., and long. 35° to 41° east. The surface is for the most part level and very fertile, and produces grain of various kinds, hemp, flax, silk, cotton, madder, tobacco, and cochineal. The vilayet of D.—or of Syria as it is also called—is accounted the most important vilayet of Turkey. Pop. 604,170.

DAMASCUS BLADE. See DAMASKEENING.

DAMASK, the name given to all textile fabrics in which figures of flowers, fruits, or others not of geometrical regularity, are woven. The word is supposed to be derived from the city of Damascus having been an early seat of these manufactures. From the intricacy of the early process, the art of D. weaving was long a mystery confined to a few localities; but since the introduction of the Jacquard machine, it is extensively employed wherever ornament is wanted in the stuffs used for dress or house-furnishings. The rich satins and brocades of Lyons and Spitalfields, the flowered ribbons of Coventry, and the bed and window curtains of Halifax and Bradford, are all examples of D. manufacture; but it is in the department of table-linen that the art has had its widest scope and greatest triumphs. The principal seats of the manufacture, on the continent of Europe, are at Courtrai and Liege in Belgium, and in some parts of Saxony, Silesia, and Austria; in England, to a considerable extent at Barnsley, in Yorkshire; in Ireland, at Belfast, Lisburne, and Ardoyne; and in Scotland, at Dunfermline, which may be called the metropolis of the manufacture.

There are three descriptions of D. known in the trade—viz. 1. Full harness, which is generally employed in patterns of limited size and minute detail, the peculiarity being that the Jacquard machine only lifts one thread by each needle, and in such cases, the pattern is repeated to fill up the breadth wanted. 2. "Single" or "common" D., in which any number of threads, from two to seven, can be lifted by one needle, to form the pattern; while the ground is produced by a set of five shafts and heddles, giving from twice to seven times the extent of pattern obtained from the same machine by the full-harness process. In full harness and single D. goods, a square fabric is considered the proper medium, that is, the warp and weft equal; but sometimes a thread or two less or more on warp or weft is used, according to the effect wanted to be produced. 3. In double D., the pattern is produced in the same way as in single, and the ground formed by eight shafts and heddles, forming what the weavers call an eight-leaved twill, absorbing one half more weft than warp, and giving that fine satin-like ground which distinguishes double damask. Besides these descriptions of D., a mixed cotton and woolen colored fabric in table-covers has been introduced, and is now manufactured extensively, the ground of which is woven with twelve shafts.

To give an idea of the capital required to work the finer branches of the trade, it may be mentioned, that it is quite usual for the mere designing and painting of a pattern to cost $250; and $350 has been paid for some extensive designs; while the famous "Crimean hero" pattern, containing portraits of the queen, prince consort, emperor Napoleon, etc., cost $3000 of outlay, ere a yard of cloth could be brought to market, employing seven Jacquard machines, consuming 50,000 cards, and containing 4,800 threads in the square yard. In 1836, there were in Dunfermline 3,000 D. and 517 diaper looms, and the capital embarked in the trade was estimated at £826,261, and the total number of persons employed, 5,044. Steam-power was successfully inaugurated in 1849, when one factory employed about 100 power-looms. In 1877, there were 11 power-loom factories, with 4,000 looms, two thirds of which were employed in the weaving of damask. When it is considered that the production of one power-loom is equal to that of four hand-looms, some idea may be formed of the development of the trade since 1836.—A good description of D. and the D. loom is to be found in Chalmers's *History of Dunfermline*, vols. i. and ii. Of late years, several fine collections of damask have been made. Of the one in the South Kensington Museum, London, an illustrated catalogue has been prepared by the Rev. Dr. Rock. Illustrations in color of the same are also published by the directors of the museum.

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DAMASKEEN'ING, or DAMASCEN'ING, is the art of producing upon ordinary steel certain ornamental appearances resembling those observed on the famous Damascus blades. Attention was first drawn to this branch of industry by the crusaders, who brought from Damascus to Europe many articles made of superior steel, such as sword-blades and daggers. These were found to possess not only great elasticity, united with considerable hardness, but their surfaces were covered with beautiful designs, formed by a tissue of dark lines on a light ground, or light lines upon a dark ground, and occasionally by the inlaying of gold on the steel-blue ground. These Damascus blades appear to have been constructed of steel and iron welded together; and the elegant designs were brought out by immersing the blades in dilute acids, which, eating away unequally the surface, gave rise to the mottled appearance. In genuine Damascus blades, the designs run through the substance of the blade, and the watering, or regular, almost symmetrical figuring is not worn off by friction, or even grinding. Imitations of the watering of Damascus steel are produced on common steel by etching with acids; and in this way landscapes, inscriptions, and ornaments, and decorations in general, are imprinted on the steel-blue ground. Gold and silver are also inlaid in the higher-class of sword-blades and other articles. Gun-barrels are occasionally subjected to the process of damaskeening. Attempts have been made in France to accomplish damaskeening by means of photography, but as yet with very imperfect results.

DAM'ASUS, SAINT, Bishop of Rome, was by extraction a Spaniard, and born probably early in the 4th century. In 366 A.D., he was elected bishop of Rome, but had to struggle fiercely for the possession of his office with one Ursinus, who was supported by a considerable party. His career was throughout far from peaceful. It was mainly spent in subduing the still numerous Arians in the west; in combating the heresy of Apollinaris, which he caused to be condemned by the council assembled at Constantinople in 382; and in defending the cause of Paulinus against Meletius. He died 384. It is difficult to form a just estimate of D.'s character. His enemies used to call him *Auriscalpius Matronarum* ("The ear-tickler of the married ladies"), and hinted that he was in the habit of inducing rich female penitents to make testamentary bequests in his favor—a conspicuous vice of the clergy at that time; so much so, indeed, that Valentinian was obliged to issue an edict forbidding ecclesiastics to receive such bequests for the future. The edict was addressed to D., who was required to announce it to the church. On the other hand, he was a great friend of St. Jerome, and was primarily instrumental in inducing that learned divine to undertake a new translation of the Bible. His extant works consist of seven epistles, addressed to various bishops, and rather more than forty short poems, religious, descriptive, etc., but of little or no merit. The first edition was published at Rome by Sarrazanius in 1638. D.'s festival falls on the 11th December.

DAM'ASUS II., a native of Bavaria, a bishop in the Tyrol, chosen the 155th pope on the death of Clement II., in 1047. His reign lasted but 23 days.

DAMBOOL', a vast rock-temple of the Buddhists in Ceylon, containing, among a profusion of carvings, figures of Buddha, of extraordinary magnitude. See *Ceylon*, by sir J. Emerson Tennent (Lond. 1859), vol. ii. p. 577.

DAME (Lat. *domina*, a mistress), a title of honor which long distinguished high-born ladies from the wives of citizens, and of the commonalty in general. In the age of chivalry, it was customary even for a queen to be so called by her chosen knight ("the dame of his heart, of his thoughts," etc.). In consequence of the greater courtesy shown towards women of higher rank, arose the custom of prefixing the word *ma* to *dame*, as a special proof of veneration and homage. Hence, too, the Virgin-mother was called in France *Notre-Dame* ("*Our* mistress," or lady, as if no one Christian could exclusively claim the privilege of serving her with the homage of his heart). The daughters of the king of France, as soon as they came into the world, were called *madame;* and this was also the sole title of the wife of the king's eldest brother. In England, the word D., though not much used, is now applied to married women of all classes. *Madame* is shortened into madam, which is still a word of honor, applicable, in particular cases, to majesty itself. Thus, Lord Tennyson, in dedicating his poems to Queen Victoria, speaks as a chivalrous troubadour might have done—

"Take, *madam*, this poor book of song."

DAME'S VIOLET, *Hesperis*, a genus of plants of the natural order *cruciferæ*, having four-sided or two-edged pods, and containing several species, annual and biennial herbaceous plants, natives, chiefly, of the middle and s. of Europe. One only, the COMMON D. V., or WHITE ROCKET (*H. matronalis*), is found in Britain, in hilly pastures, but perhaps rather escaped from cultivation than a true native. It has an erect branched stem, with ovato-lanceolate leaves, and terminated by numerous large lilac-flowers, which are scentless by day, but very fragrant at night, on which account this plant is cultivated in flower-pots by German ladies. The custom appears to have been an old English one also, and from it the plant derives its common name. The NIGHT-SCENTED ROCKET (*H tristis*) is also a favorite flower in Germany.

DAMIA'NI, PIETRO, 1000–72; a Roman Catholic prelate, eminent, intellectually, and morally, who supported various reforms which Hildebrand (the great pope, Gregory

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VII.) also favored, for which he was persecuted by the corrupt priests of Milan. He was appointed cardinal bishop of Ostia, 1057. In 1069, he was sent as legate to Germany to dissuade Henry IV. from applying for a divorce, in which he was successful. He was engaged on other occasions to make peace and suppress disorder.

DAMIANA. See APHRODISIACS.

DA'MIANISTS, or ANGELISTS, a sect of the 6th c., followers of Damianus, a patriarch of Alexandria, who agreed substantially with the Sabellians.

DAMIEN, FATHER, the name assumed by Joseph de Veuster, b. Jan. 3d, 1840, a Belgian, on his ordination to the Roman Catholic priesthood in 1864, at Honolulu in the Sandwich Islands. In 1873 he went to the leper settlement at Molokai, where he labored with great zeal and self-denial until his death in 1889. His story is alluded to in *Oceana*, by J. A. Froude, and excited much sympathy all over the world.

DAMIENS, ROBERT FRANÇOIS, known for his attempt to assassinate Louis XV., was born in 1715, at Tieulloy, a village near Arras, in France. He was evilly-disposed from his youth, being known even then as *Robert le Diable*. On account of a robbery which he had committed, he was obliged to flee into Belgium in 1756, whence he returned to Paris about the end of the year. It was during his absence in that country that he formed the intention of assassinating his sovereign. The motives which led him to this are not well understood. He himself alleged that it was the conduct of the king towards the parliament; while a more popular, but apparently groundless opinion was, that he was instigated by the Jesuits. On the 5th of Jan., 1757, having gone to Versailles on the previous day, he assiduously followed the king and his courtiers about everywhere; and about six o'clock at night, when the king was entering his carriage to leave Trianon, managed to stab him. The king, however, recognized his assassin, and D. was seized. The punishment inflicted on him was horrible. The hand by which he attempted the murder was burned at a slow fire; the fleshy parts of his body were then torn off by pincers; and, finally, he was dragged about for an hour by four strong horses, while into his numerous wounds were poured molten lead, resin, oil, and boiling wax! Towards night, the poor wretch expired, having by an effort of will almost superhuman, kept his resolution of not confessing who were his accomplices—if, indeed, he had any. His remains were immediately burned, his house was destroyed, his father, wife, and daughter were banished from France forever, and his brothers and sisters compelled to change their names.

DAMIET'TA, a t. of Lower Egypt, situated on the right bank of the chief of the Nile's eastern branches, about 8 m. from its mouth in the Mediterranean, in lat. 31° 25′ n., long. 31° 49′ east. It is in general ill and irregularly built, but it has some handsome mosques and marble baths, and several bazaars. Its commerce has been much injured by the prosperity of Alexandria. It still, however, carries on a considerable trade in exporting rice, which grows abundantly in the neighborhood, fish (from Lake Menzala), coffee and dates, etc.; and in importing charcoal, soap, silk, and manufactured goods of various kinds. It is connected by railway and telegraph with Cairo, etc. The cloth known as *dimity* received its name from D., where it was first manufactured. A bar at the mouth of the river prevents vessels of more than 50 or 60 tons burden from ascending to Damietta. Pop. '82, 34,046. The existing town was erected about 1251, but prior to that, a city of the same name (more anciently Tamiáthis) stood about 4 m. to the south. It was strongly fortified by the Saracens, and formed on that side the bulwark of Egypt against the early crusaders, who, however, succeeded in capturing it more than once. It was razed, and rebuilt further inland on the site it now occupies, by the sultan Baybers.

DAMIRON, JEAN PHILIBERT, 1794–1862; a French philosophical writer who studied under Burnouf, Villemain, and Cousin. He lectured on philosophy in various Parisian institutions, became professor in the normal school, and titular professor at the Sorbonne. He was one of the founders of the *Globe* newspaper, a member of the legion of honor, and of the academy of sciences. He published a number of philosophical works, particularly on the history of philosophy in France.

DAM'MAR, or DAMMAR PINE, *Dammara*, a genus of trees of the natural order *coniferæ*, distinguished from all the rest of that order by their broad lanceolate leathery leaves, which have numerous nearly parallel veins, and by their seeds being winged, not at the end, but on one side. The tree from which the name, originally applied to its resinous product, has been extended to the whole genus, is the MOLUCCAN D. (*D. orientalis*), which grows on the high mountain-ridges of the Molucca islands. It grows to a great height, attains a diameter of 9 ft., and generally has the lower part of the trunk beset with knots as large as a man's head. The timber is light and of inferior quality; and the tree is chiefly valuable for its resin, which is soft, transparent, hardens in a few days, and is then white, with a crystalline appearance. The resin often flows spontaneously from the tree in such quantity, that it hangs in masses like icicles of a handbreadth and a foot long. At another period of the year, it is yellow, and less valued. By incision, especially in the protuberances of the stem, it is obtained in large pieces. So long as *dammar resin* is soft, it has a strong smell; but loses it when it dries. It contains only a trace of volatile oil, but consists

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of two distinct resins, one of which is soluble in alcohol, the other not. It is light, brittle, and easily friable, readily soluble in oil of turpentine; quickly becomes viscid when heated; when sprinkled on burning coal, diffuses an odor like that of rosin or mastich; readily takes fire, and burns with much smoke and a somewhat acid smell. It is used in Asia for domestic purposes, and in the arts like other resins; it is an article of commerce, and in Europe is employed in various ways to form varnishes, which dry quickly, have a very bright luster, and being colorless, allow the beauty of the colors over which they are spread to be perfectly seen; but readily becomes viscid again, and are not permanent, so that this resin cannot be made a substitute for copal and amber. It is almost completely soluble in benzole, and in this solvent, makes an excellent colorless varnish for positive photographs on glass—it is, however, scarcely hard enough for negatives.—To this genus belongs also the Kauri Pine (q.v.) of New Zealand (*D. Australis*), which produces the resin known as *kauri resin*, or *kauri gum*.—The word *dammar*, *dammer*, or *damar*, signifies *resin* in some of the languages of India. The resin known as BLACK DAMMAR is obtained in the Molucca islands from the trunk of *marignia acutifolia*, a tree of the natural order *amyridaceæ*. It is a semi-fluid soft resin, with a strong smell, becoming black when it dries; it is used as pitch, also to yield a kind of turpentine, which is obtained by distillation.—*Canarium microcarpum*, a tree of the same order, also a native of the furthest east, yields, by incision of the trunk, a viscid, odorous, yellowish substance, very similar to balsam of copaiva, which is called *damar* or *dammar*, and is used in naval yards as oakum, being mixed with a little chalk and the bark of reeds, and becomes as hard as a stone.—Quite distinct from all these is the resin also called *dammar* or *piney dammar* in India, often also called copal (q.v.) in India, and *anime* (q.v.) in Britain, the produce of *vateria Indica*, a large tree of the natural order *dipteraceæ*. It is obtained by wounding the tree, and when fresh, is clear, fragrant, and acridly bitter; when dried, it becomes yellow, brittle, and glass-like. It is used in India as a varnish (*piney varnish*), which is hard, tenacious, and much esteemed. It is also made into candles in Malabar, which, in burning, diffuse an agreeable fragrance, and give a clear light with little smoke. Some of these candles were sent to Britain, and were highly prized, but the excessive duty stopped the importation. *Shorea robusta*, the sal (q.v.), so much valued in India as a timber-tree, also of the natural order *dipteraceæ*, and some other species of *shorea*, yield a resin, also known as *dammar*, and as *ral* and *dhoona*, which is much used in dock-yards in India as pitch.

DAMMU'DAH, or DAMODAR, a river of India, rises in Ramgurh, a district in the presidency of Bengal, about lat. 23° 55′ n. and long. 84° 53′ e.; and after a generally s.e. course of 350 m., it enters the Hoogly from the right, in lat. 22° 13′ n., and long. 88° 7′ east. The valley of the D.—traversed by the main railway between Calcutta and the n.w. (the East Indian railway)—abounds in coal and iron. Its chief tributary is the Barakhar, which flows into it from the n. Below the mouth of the Barakhar the D. is navigable.

DAMO'CLES, one of the courtiers and sycophants of the elder Dionysius, the tyrant of Syracuse. It is recorded by Cicero that D., having lauded in the highest terms the grandeur and happiness of royalty, was reproved by Dionysius in a singular manner. The sycophant was seated at a table, richly spread and surrounded by all the furniture of royalty, but in the midst of his luxurious banquet, on looking upwards, he saw a keen-edged sword suspended over his head by a single horse-hair. A spectacle so alarming instantly altered his views of the felicity of kings.

DA'MON AND PYTH'IAS, or PHIN'TIAS, two noble Pythagoreans of Syracuse, who have been remembered as models of faithful friendship. Pythias having been condemned to death by Dionysius the tyrant of Syracuse, begged to be allowed to go home, for the purpose of arranging his affairs, Damon pledging his own life for the reappearance of his friend. Dionysius consented, and Pythias returned just in time to save Damon from death. Struck by so noble an example of mutual affection, the tyrant pardoned Pythias, and desired to be admitted into their sacred fellowship.

DAMPER, a door or valve which, by sliding, rising and falling, turning on a hinge, or otherwise, diminishes the aperture of a chimney or air-flue; this lessens the quantity of air that can pass through a furnace or other fire, and thus "damps" or checks the combustion.—The D. of a pianoforte is that part of the mechanism which, after a key is struck, and the finger is lifted up from the key, immediately checks or stops the vibration of the string. It consists of a second hammer, which, on the rising of the key, strikes the string and remains upon it, instead of bounding off as the sounding-hammer does. Perfect damping is always desirable, but seldom obtained, especially in upright pianofortes. In respect of damping, the pianofortes of the German makers are superior to the English. The more perfect the damping is, the more distinctly and clearly the passages and harmony are heard, while the instrument gains in purity of tone, when there is none of that confusion of sounds which arises from imperfect damping.

Damper is also the name given in Australia to a simple kind of unleavened bread formed of wheat flour. It is made while traveling in the bush, and baked among the ashes of a fire often kindled for the purpose.

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DAMPIER, WILLIAM, a celebrated English navigator, was b. of a Somersetshire family in 1652. He early went to sea, where he was soon distinguished alike by his intelligence and enterprise. Along with a party of buccaneers, D. crossed the isthmus of Darien in 1679, and embarking on the Pacific in canoes and similar small craft, captured several Spanish vessels, in which they cruised along the coast of Spanish America, waging war with the Spanish subjects. In 1684, D. engaged in another buccaneering expedition, in which he coasted along the shores of Chili, Peru, and Mexico, sailing thence to the East Indies, touching at Australia, and after some time returning to England, where in 1697 he published an interesting account of the expedition, entitled *A Voyage Round the World*. He was afterwards deputed by government to conduct a voyage of discovery to the South seas, in which he explored the w. and n.w. coasts of Australia, also the coasts of New Guinea, New Britain, and New Ireland, giving his name to the Dampier archipelago and strait (q.v.). The events of the latter part of D.'s life are not well known. The following are his other principal works: *Voyages to the Bay of Campeachy* (Lond. 1729); *A Treatise on Winds and Tides;* and a *Vindication of his Voyage to the South Sea in the Ship St. George* (1707). He d. in 1715.

DAMPIER ARCHIPELAGO AND STRAIT take their names from the famous navigator and buccaneer. The *strait*, which is 35 m. wide, separates the island of Waygiou from the n.w. extremity of Papua or New Guinea, lying almost immediately under the equator, and about long. 131° e., so as to be, as nearly as possible, the antipodes of the mouth of the Amazon. The *archipelago*, again, is off the n.w. coast of Australia, about lat. 21° s., and long. 117° east. The principal islands of the cluster are Enderby, Lewis, Rosemary, Legendre, and Depuch.

DAMPING OFF, in horticulture, the death of plants from excess of moisture in the soil and atmosphere. Young seedlings in stoves and hotbeds are particularly liable to it. Although the cause is sufficiently obvious, prevention is not always easy; not only because some plants are very sensitive as to moisture, but also because the necessity of keeping sashes closed on account of temperature often stands in the way of the ventilation which would otherwise be desirable, and it is when a moist atmosphere stagnates around them, and the temperature is not very low, that plants are most liable to damp off.

DAMROSCH, LEOPOLD, M.D., eminent musician, composer, and director of operas, was born in Posen, Prussia, Oct. 22, 1832. His parents chose the profession of medicine for him, and after graduating at the University of Berlin, he returned to Posen to practice; but his passionate love of music, which he had continued to study incidentally, prevailed, and in 1854 he abandoned his profession for the study of counterpoint and composition under Herbert Reis and Prof. Dehn. In 1855 he started out as a concert violinist in Magdeburg; became acquainted with Liszt, and under his influence began to write for the *Neue Zeitschrift für Musik*. He was director in Posen and in Breslau, and in 1871 came to New York as director of the Arion Society. The credit of firmly establishing choral organizations in New York belongs entirely to Dr. Damrosch; the Oratorio Society, established in 1873, and now a magnificent body of 500 voices, ranks among the foremost societies in the world, while the Symphony Society, established in 1877, is another monument to his enterprise and devotion. But the most brilliant achievement of his life was the successful establishment of German opera in New York city, notwithstanding the obvious difficulties of the undertaking. A sudden cold contracted at a rehearsal in this latter work terminated his life, Feb. 15, 1885. He was also a composer of fine attainments, his work comprising several cantatas, a festival overture, beside violin concertos and songs.

DAMROSCH, WALTER, son of Leopold, was b. in Breslau, Prussia, Jan. 30, 1862; was made conductor of the Harmonic Society of Newark, N. J., in 1881, and organist of Plymouth Church, Brooklyn, in 1884. In 1885 he succeeded his father as conductor of the Oratorio and Symphony societies and as assistant conductor of German Opera at the Metropolitan Opera House, New York; and in 1891 became musical director of the Carnegie Music Hall in the same city. He produced in 1896 an opera, *The Scarlet Letter*, founded on the novel by Hawthorne.

DAM'SON, a rather small oval-fruited variety of the common plum, much esteemed for preserving, and not wholly unfit for dessert. The tree grows to a considerable height, but has a bushy, sloe-like appearance. It is extremely fruitful. There are many sub-varieties, with fruit of different colors, dark purple, bluish, black, yellow, etc. Damsons are produced in great quantities in some parts of England. D. pies, and *D. cheese*—made somewhat in the manner of fig-cake—are well-known English luxuries. The name is a corruption of *Damascene*, from Damascus.—The MOUNTAIN D. or BITTER D. of the West Indies is the simaruba.

DAN, a city, the position of which, at the northern extremity of Palestine, is determined: 1. By its being the northern point on the road to Damascus, at which Abraham overtook the allied forces that had plundered Sodom. 2. By its frequent designation as the northern limit of the land, as in the familiar expression—"From Dan to Beersheba." 3. By the statement of Josephus, that it stood at the lesser fountain of the Jordan; and that of Jerome, that at it the Jordan took its rise, and, as he thought from his view of the etymology, obtained its name Jor-Dan, as "the river of Dan." 4. By Dr. Robinson's discovery, in the same locality, of "a mound, from the foot of which gushes out one of the largest fountains of the world—the main source of the Jordan," the signification of whose Arabic name *Tell el Kadi*, "the judge's mound," agrees with that of the Hebrew *Dan*, "a judge." The manner in which the tribe of

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Dan acquired possession of this region, as well as the account of the introduction of idolatry into their new home, is told in Judges xviii. See DAN. This idolatrous worship continued for 400 years, and then Jeroboam remodeled the worship, making Dan the religious centre for the northern part of the kingdom which he had usurped. This it continued to be until, about 250 years later, the people were carried captive into Assyria. At the present day the top of the mound is strewed with ruins, including traces of old foundations and heaps of large stones. There are ruins also on the plain below. The fertility of the plain or valley, remarkable in the times of the Sidonians, continues to the present day.

DAN, the fifth son of Jacob and the first by his wife's maid Bilhah. He was own brother to Naphtali, and there is a close affinity between his name and that of Dinah, Jacob's only daughter. The tribe of Dan was, next to Judah, the most numerous of the twelve tribes at the numbering in the wilderness; yet he was the last of all to receive his portion of the land, and that portion was the smallest of all. The Bible gives but little of the history of the tribe, which seems to have been easily and often led to copy the idolatry of the surrounding heathen.

DANA, CHARLES ANDERSON, LL.D., b. N. H., 1819. He studied at Harvard for two years, but an affection of the eyes compelled his retirement. He was one of the members of the Brook Farm socialistic community, near Boston, and was one of the editors of *The Harbinger*, a journal advocating the ideas of Fourier. In 1847 he became a writer on the *New York Tribune*, and was correspondent of that journal in France during the revolution of 1848. Returning to New York, he became first assistant (or managing) editor of the *Tribune*, which position he filled until about the close of 1861, when the "On to Richmond" editorial, immediately followed by the disastrous defeat of the union forces at Bull Run, led to such disagreement with Horace Greeley, the editor of the paper, that Dana was compelled to resign. He was not long afterwards appointed assistant secretary of war. After the war he became the editor of a new republican paper in Chicago, but the enterprise was not successful. Returning to New York, he became one of a company to purchase *The Sun*, the oldest of the cheap papers of the country. He was chosen chief editor, which position he retains. Besides his work as a journalist, he edited a *Household Book of Poetry;* in connection with George Ripley was the editor of Appleton's *New American Cyclopædia*, and published *The Art of Newspaper Making* (1895), *Lincoln and His Cabinet* (1896), etc. D. 1897.

DANA, CHARLES LOUIS, M.D., an American neurologist, was born at Woodstock, Vt., Mar. 25, 1852, received his education at Dartmouth College and the New York College of Physicians and Surgeons. He has been professor of physiology in the New York Woman's Medical College; of nervous and mental diseases at the New York Post-graduate medical school; of nervous diseases in Dartmouth medical college, and was also president of the neurological Association and has written *Text Book on Nervous Diseases* (1892).

DANA, FRANCIS, LL.D., 1743–1811; b. Mass.; graduate of Harvard; admitted to the bar in 1767. He was a delegate to the first provincial congress of Massachusetts. In 1781 he was appointed minister to Russia. In 1785 he was appointed justice of the supreme court of Massachusetts. He was a delegate to the convention which framed the federal constitution. In 1791 he was made chief-justice of Massachusetts.

DANA, JAMES DWIGHT, LL.D., b. N. Y., 1813; graduate of Yale, eminent as a naturalist and geologist. He was with the Wilkes exploring expedition to the southern oceans sent out by the federal government in 1838. In 1846, he became one of the editors of the *American Journal of Science;* in 1855 he was chosen professor of natural history and geology in Yale College. His publications include *System of Mineralogy* (1837, rev. eds. 1868 and 1892), and *Manual of Geology* (1863, rev. eds. 1880 and 1895). He died in 1895.

DANA, NAPOLEON JACKSON TECUMSEH, b. Me., 1822; graduated at West Point in 1842. He served in the war with Mexico, and through the war of the secession, and was seriously wounded at Antietam. In 1865 he resigned with the rank of major-general.

DANA, RICHARD, 1700–1772; b. Mass., grandson of Richard, who was the first of the family in America. He was a graduate of Harvard, bred to the law, and prominent in resistance to the acts of the British government which preceded the revolution. He was also a member of "The Sons of Liberty."

DA'NA, RICHARD HENRY, an American poet and novelist, was born in 1787, at Cambridge, Mass. After leaving Harvard college, at which he had remained three years, he adopted law as a profession, but eventually renounced it, and applied himself to literature. In 1817, he became a contributor to the *North American Review*, his connection with this periodical continuing for three years, during a portion of which time he assisted in its editorship The *Idle Man*, which contains many of his best prose efforts, was commenced in 1821, but proving a failure in a commercial point of view, was soon discontinued. Having at an earlier date published the *Dying Raven*, a poem of great merit, he came forward, in 1827, with the *Buccaneer*, and other poems. In 1839, D. delivered in Boston and New York a series of lectures on Shakespeare. Died 1879.

DANA, RICHARD HENRY, Jr., b. Mass., 1815, a son of Richard Henry, the poet: graduated at Harvard, and bred to the law. In consequence of ill health he made a voyage at sea, of which he published a description in *Two Years Before the Mast*. He

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was admitted to the bar in 1840, and made a specialty of admiralty cases. In 1841, he published *The Seaman's Friend, containing a Treatise on Practical Seamanship*, and also an edition of Wheaton's *International Law*. He was one of the leaders of the free-soil party, and wrote and spoke much on political subjects. He d. 1882.

DANA, SAMUEL LUTHER, LL.D., 1795–1868; b. Mass.; a writer on chemistry and agriculture. While chemist of the Merrimack print-works he invented a method of bleaching cotton goods which was widely adopted.

DAN'AË, the daughter of Acrisius, king of Argos, and Ocaleia. According to the mythological narrative, an oracle had announced that she would one day give birth to a son, who should kill his grandfather. Acrisius, of course, felt extremely uncomfortable after this declaration, and took every precaution to keep D. a virgin. He shut her up in a dungeon, where, nevertheless, she was visited by Zeus in a shower of gold, and became, in consequence, the mother of Perseus. Acrisius put both the mother and child into a chest, and exposed them on the sea. The chest, however, drifted ashore on the island of Seriphos, and D. and her child were saved. D. remained in the island until Perseus had grown up and become a hero famous for his exploits. She afterwards accompanied him to Argos. On his arrival, Acrisius fled, but was subsequently slain accidentally by Perseus at Larissa.

DA'NAIDE, an hydraulic machine made of two cylinders one within the other, turning easily on a vertical axis, and having a small space between them. The smallest one is closed at the bottom, and the other has a hole in the middle of its base. The bottoms of the two are separated by partitions reaching from the circumference to the center, but the ring-like space between the cylinders is open. If water be turned into this space horizontally to the surface of the cylinders, they begin to revolve by friction, which motion is increased by the water in revolution acting on the radial partitions in the base. Nearly three quarters of the hydraulic power can thus be utilized.

DAN AÜS, a mythical personage, the son of Belus and Anchinoë, brother of Ægyptus, and originally ruler of Libya. Thinking his life in danger from the machinations of his brother, he fled to Argos, accompanied by his fifty daughters, known as the DANAIDES, where he was chosen king, after the banishment of Gelanor, the last of the Inachidæ. The fifty sons of Ægyptus followed him, and under the pretense of friendship, sought the hand of his daughters in marriage. D. consented, but on the bridal-night he gave his daughters each a dagger, and urged them to murder their bridegrooms in revenge for the treatment he had received from Ægyptus. All did so, except one, Hypermnestra, who allowed her betrothed, Lynceus, to escape. D., as may naturally be supposed, found great difficulty in obtaining new husbands for his daughters; and in order to get them off his hands, instituted games, where they were given as rewards to the victors, although they could scarcely have been considered very tempting prizes. As a punishment for their crime, they were compelled, in the under-world, to pour water for ever into a vessel full of holes. So runs the myth; but Strabo mentions an old tradition, which declares D. and his fifty daughters to have provided Argos with water, which is probably the origin of the scene in Hades. Greek art, of course, represents the Danaides in conformity with the popular myth. The tomb of D., in the Agora of Argos, was shown as late as the time of Pausanias.

DANBURY, city and one of the co. seats of Fairfield co., Conn.; on the New England and the New York, New Haven and Hartford railroads; 20 miles n.w. of Bridgeport. D. was permanently settled in 1684, and was burned by the British in Apr., 1777, when Gen. Wooster was mortally wounded. It has a court-house, public library, national and savings-banks, high school, opera-house, churches, public parks, water-works, a beautiful cemetery, a soldiers' monument, and one to Gen. Wooster, electric lights and street railroads, and daily, weekly, and monthly periodicals. An annual agricultural fair is held here. The manufacture of hats, begun in 1780, employs a capital of more than $2,000,000. Other articles produced are machinery for making hats and cutting fur, boots and shoes, paper and wooden boxes, shirts, iron, and sewing-machines. Pop. 1756, 1527; 1830, 4331; 1890, 16,552.

DAN'BY, FRANCIS, A.R.A., a painter, b. about 6 m. from Wexford, in Ireland, 16th Nov., 1793. He was educated in the school of the society of arts, Dublin, and soon gave indications of superior artistic talent. His first attempts were sent to the Dublin exhibition. After 1820, he took up his residence at Bristol, whence he sent to the royal academy, London, his "Disappointed Love" (1821), "Warriors of the Olden Time Listening to the Song of their Minstrel" (1823), and "Sunset at Sea after a Storm" (1824). In 1825, D. produced "The Delivery of Israel out of Egypt;" in 1826, "Christ Walking on the Sea;" in 1827, "The Embarkation of Cleopatra on the Cydnus;" and in 1828–29, "An Attempt to Illustrate the Opening of the Seventh Seal," "The Passage of the Red Sea," and "The Deluge." Circumstances now induced him to visit the continent, where he resided till 1841, during which interval he executed very few paintings. On his return, he took up his abode at Exmouth, where he died in 1861. Among his later works, may be mentioned "A Morning at Rhodes" (1841).

DANCE, GEORGE, JR., 1740–1825; an English architect. Among his designs was that for Blackfriars bridge in London. He was associated with his brother Nathaniel

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in the foundation of the royal academy, of whose original members he was for several years the last survivor. Newgate prison and the front of Guildhall were built from his designs. His father, also named George, was noted as an architect.

DANCE OF DEATH (Lat. *Chorea Machabæorum*, Fr. *La Danse Macabre*), a name given to a certain class of allegorical representations, illustrative of the universal power of death, and dating from the 14th century. When the introduction of Christianity first banished the ancient Germanic conception of a future state, a new description of death-mythology arose, partly out of biblical sources, partly out of the popular character itself, wherein the last enemy was represented under simple and majestic images, such as that of a husbandman watering the ground with blood, plowing it with swords, rooting out weeds, plucking up flowers, or felling trees, sowing it with corpses; or of a monarch assembling his armies, making war, taking prisoners, inviting his subjects to a festival, or citing them to judgment. But with a gradual change in national manners came a change in the mode of treating the subject, and it was associated with every-day images, such as the confessional, chess-playing, and above all, with the adjuncts of a festival—viz., music and dancing. This tendency to familiarize the theme increased during the confusion and turmoil of the 14th c., when the national mind alternated between fits of devotion and license, or blent both elements in satire and humor. Such a mood as this naturally occupied itself with personifying death, and adopted by preference the most startling and grotesque images it could find—that of a musician playing to dancing-men, or a dancer leading them on; and as the dance and the drama were then intimately connected, and employed on religious occasions, this particular idea soon assumed a dramatic form.

This drama was most simply constructed, consisting of short dialogues between Death and four-and-twenty or more followers, and was undoubtedly enacted in or near churches by religious orders in Germany during the 14th c , and at a rather later period in France. It would appear that the seven brothers, whose martyrdom is recorded in the 7th chapter of the 2d book of Maccabees, either played an important part in the drama, or the first representation, which took place at Paris, in the Cloister *aux Innocents*, fell upon their festival, and hence the origin of the ancient name, Chorea Machabæorum, or La Danse Macabre. As early as 1400, the dramatic poem was imitated in Spain, and appears there in 79 strophes of 8 lines each (*La Dança General de los Muertos*), but it did not spread; while the French, having a love for pictorial representation, very early affixed an illustration to each strophe, and in 1425 painted the whole series on the church-yard wall of the Cloister of the Innocents, where the Dance of Death was habitually enacted. We find the subject treated in painting, sculpture, and tapestry, in the churches of Anjou, Amiens, Angers, Rouen, to say nothing of the numerous wood-cuts and accompanying letter-press which succeeded the invention of printing. From Paris, both poem and pictures were transplanted to London (1420), Salisbury (about 1460), Wortley hall in Gloucestershire, Hexham, etc.

But nowhere was the subject so variously and strikingly treated as in Germany. A picture in one of the chapels of the Marienkirche, at Lubeck, still, in spite of repeated repaintings, bearing the unmistakable impress of the 14th c., exhibits the very simplest form of the drama, and has some genuine Low German verses attached to it. Here we see 24 figures, partly clerical, partly lay, arranged in a descending scale, from the pope himself down to a little child, and between each of them a dancing-figure of Death, not in the form of a skeleton, but a shriveled corpse, the whole being linked in one chain, and dancing to the music of another Death. This representation is almost the same as a very ancient one at La Chaise-Dieu, in Auvergne, and points to the identity of the original dramatic spectacle in both countries.

The celebrated "Dance of Death" on the cloister walls of the Klingenthal, a convent in Basel, though painted probably not later than 1312, exhibited a departure from the simplest form—the number of persons exceeding the original 24, and the chain being broken up into separate couples. But both alike are only to be regarded as scenes from a drama, and cannot, therefore, be justly compared with a contemporary Italian painting, the "Triumph of Death," by Andrea Orcagna. And the acted drama enduring till the 15th c., we find that while there were varieties in the paintings, the poem, which was the most important feature, remained unchanged.

About the middle of the 15th c., however, the drama being altogether laid aside, the pictures became the main point of interest, the verses merely subsidiary. Accordingly, we find from this time the same pictures repeated in different places, with different verses, or no verses at all, till at length both verses and pictures entirely change their original character. The "Dance of Death" being transferred from the quiet convent walls into public places, gave a new impulse to popular art. Duke George of Saxony had, in 1534, the front of his Dresden castle ornamented with a life-size bas-relief of the subject, and other representations are to be found at Strasburg and Bern. There was a "Dance of Death" painted round the cloister of old St. Paul's in London, in the reign of Henry VI.; and there is a sculptured one at Rouen, in the cemetery of St. Maclou. But Holbein has the credit of availing himself most effectively of the original design, and giving it a new and more artistic character. Departing from the idea of a dance, he illustrated the subject by 53 distinct sketches for engravings, which he called "Imagines

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Mortis." The originals of these are at St. Petersburg, and impressions of them have been frequently repeated under different names.

We may cite as authorities on this subject, Peignot's *Recherches sur les Danses des Morts* (Dijon and Paris, 1826); Massman's *Baseler Todtentänze* (Stuttgart, 1847); and Douce's *The Dance of Death* (Lond. 1833).

DANCETTE, one of the lines of partition in heraldry, which differs from indented (q.v.) only in the greater size of the notches. The indentations where the division is *per fess* dancette, never exceed three in number.

DANCING may be defined in a general way as the expression of inward feelings by means of rhythmical movements of the body, especially of the lower limbs, usually accompanied by music. Dancing may almost be said to be as old as the world, and prevails in rude as well as in civilized nations. Children, and also the lower animals, dance and gambol as by instinct. Our early records, sacred and profane, make mention of dancing, and in most of the ancient nations it was a constituent part of their religious rites and ceremonies. They danced before their altars and round the statues of their gods. The Greek chorus, "in the oldest times, consisted of the whole population of the city, who met in the public place (*choros*, the market-place), to offer up thanksgivings to their country's god, by singing hymns and performing corresponding dances." The Jewish records make abundant mention of dancing. Moses and Miriam danced to their song of triumph, when the Israelites passed through the Red sea as on dry land; David danced before the ark. It is certain that the primitive Christians danced at their religious meetings, though we have no mention of this in the New Testament. The Greeks made the art of dancing into a system expressive of all the different passions, the dance of the Eumenides, or Furies, especially, creating such terror, that the spectators seemed to see these dreaded deities about to execute heaven's vengeance on earth. The most eminent Greek sculptors did not disdain to study the attitudes of the public dancers for their art of imitating the passions. In Homer, we read of dancing and music at entertainments. Aristotle ranks dancing with poetry, and says, in his *Poetics*, that there are dancers who, by rhythm applied to gesture, express manners, passions, and actions. In Pindar, Apollo is called the dancer; and Jupiter himself, in a Greek line, is represented as in the act of dancing. The Spartans had a law obliging parents to exercise their children in dancing from the age of five. This was done in the public place, to train them for the armed-dance. They were led by grown men, and all sang hymns and songs as they danced. The young men danced the Pyrrhic dance, in four parts, expressive of overtaking an enemy and of a mock-fight.

Dancing, as an entertainment in private society, was performed in ancient times mostly by professional dancers, and not by the company themselves. Among the sedate Romans, in fact, it was considered disgraceful for a free citizen to dance, except in connection with religion. Having professional dancers at entertainments is still the practice among eastern nations. In Egypt there are dancing and singing girls, called almé, who improvise verses as in Italy. They are highly educated, and no festival takes place without them. They are placed in a rostrum, and sing during the repast; then descend, and form dances that have no resemblance to ours. All over India there are nautch girls or bayaderes (q.v.), who dance at festivals and solemnities.

It is among savage nations that the passion for dancing is most strongly manifested. Their dances are mostly associated with religion and war; and the performers work themselves into a state of frantic excitement—a kind of mechanical intoxication. As civilization advances, dancing—amateur dancing, at least—assumes a more and more subdued character. As a social amusement and a healthful exercise, dancing has much to recommend it; the chief drawbacks are the ill-ventilated and overheated rooms in which it is generally performed. By many, it is unfavorably regarded in a moral point of view; but this seems a relic of that outburst of puritanism that characterized the 17th c., and which saw sin in every joyous excitement. Dancing is doubtless liable to abuse, but not more so than most other forms of social intercourse. Connected with the subject of dancing, see ACROBATS, BALLET, PANTOMIME, COUNTRY-DANCE, QUADRILLE, POLKA, etc.

DANCING MANIA, a form of epidemic disorder allied to hysteria (q.v.), and evidently the result of imitative emotions acting upon susceptible subjects, under the influence of a craving for sympathy or notoriety. There is little doubt that imposture entered to a considerable extent into all the epidemic forms of the dancing mania, which indeed were usually attended and followed by consequences that showed but too clearly the presence of impure motives; but there is also evidence that in many cases the convulsive movements were really beyond the control of the will, whatever may have been the original character of the motives that prompted them. Epidemics of this sort were common in Germany during the middle ages, and are formally described as early as the 14th c.; in Italy, a somewhat similar disease was ascribed to the bite of a spider called the tarantula (see TARANTISM); and similar convulsive affections have been witnessed in Abyssinia, India, and even in comparatively modern times and in the most civilized countries in Europe, under the influence of strong popular excitement, especially connected with religious demonstrations. But the true dancing mania of the middle ages had its theater chiefly in the crowded cities of Germany.

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In July, 1374, there appeared at Aix-la-Chapelle assemblies of men and women, who, excited by the wild and frantic, partly heathenish, celebration of the festival of St. John, began to dance on the streets, screaming and foaming like persons possessed. The attacks of this mania were various in form, according to mental, local, or religious conditions. The dancers, losing all control over their movements, continued dancing in wild delirium till they fell in extreme exhaustion, and groaned as in the agonies of death; some dashed out their brains against walls. When dancing, they were insensible to external impressions, but haunted by visions, such as of being immersed in a sea of blood, which obliged them to leap so high, or of seeing the heavens open, and the Saviour enthroned with the Virgin Mary. The frenzy spread overy many of the towns of the Low Countries. Troops of dancers, inflamed by intoxicating music, and followed by crowds, who caught the mental infection, went from place to place, taking possession of the religious houses, and pouring forth imprecations against the priests. The mania spread to Cologne, Metz, and Strasburg, giving rise to many disorders, impostures, and profligacy. These countries were generally in a miserable condition; and arbitrary rule, corruption of morals, insecurity of property, and superstition, prepared the wretched people, debilitated by disease and bad food, to seek relief in the intoxication of an artificial delirium. Exorcism had been found an efficacious remedy at the commencement of the outbreak; and in the beginning of the 16th c., Paracelsus, that great reformer of medicine, applied immersion in cold water with great success. At the beginning of the 17th c., the St. Vitus's dance, as the affection was called (see CHOREA), was already on the decline; and we now hear of it only in single cases as a sort of nervous affection. A detailed account of the phenomenon is given in Hecker's *Epidemics of the Middle Ages*. See CONVULSIONARIES.

DANDELION (*leontodon taraxacum*, or *taraxacum officinale*), a plant of the natural order *compositæ*, sub-order *cichoraceæ*, common throughout Britain and the whole of Europe, in pastures and by waysides, and now also so perfectly naturalized in many parts of North America, as to be there one of the most familiar spring-flowers. The names D. and leontodon (Fr. and Gr. lion's tooth) both have reference to the form of the leaves. The whole plant abounds in a milky juice, containing a peculiar crystalline principle, called *taraxacin;* has a bitter taste; and is tonic, deobstruent, and diuretic. D. root is employed in medicine, in the form of infusion, decoction, and extract, chiefly in diseases of the liver and chronic affections of the digestive organs. It contains resin, inulin, sugar, etc. When roasted and ground, it is also sometimes used as a substitute for coffee. *D. coffee*, however, is usually a mixture of ordinary coffee and the powder or extract of D. root; and *D. chocolate* is composed of one part of common chocolate and four parts of the powder of D. root. The young leaves make a good salad.

DAN'DOLO, a famous Venetian family, which has given four doges to the republic. The most illustrious of its members was Enrico D., b. about 1110 or 1115 A.D. Eminent in learning, eloquence, and knowledge of affairs, he ascended from one step to another, until, in 1173, he was sent as ambassador to Constantinople, and in 1192 was elected doge. In this latter capacity, he extended the bounds of the republic in Istria and Dalmatia, defeated the Pisans, and (in 1201) marched at the head of the crusaders. He subdued Trieste and Zara, the coasts of Albania, the Ionian islands, and Constantinople (17th July, 1203). When the emperor Alexius, who had been raised to the throne by the exertions of D., was murdered by his own subjects, D. laid siege to Constantinople, and took it by storm, 13th April, 1204. He then established there the empire of the Latins, and caused count Baldwin of Flanders to be chosen emperor. By the treaty of partition which he concluded with the other leaders of the crusade, Venice obtained possession of some of the islands of the Ionian sea, and of the archipelago, several harbors and tracts of land on the Hellespont, in Phrygia, the Morea, and Epirus, an entire quarter of Constantinople, and also, by purchase, the island of Candia. Soon after this, D. died (June 1, 1205), in Constantinople, and was buried in the church of St. Sophia. His monument was destroyed by the Turks at the taking of Constantinople in 1453.

DAN'DOLO, ANDREA, 1310–54, Doge of Venice, a member of one of the most illustrious families of that famous city. He was a student and a man of letters, and an intimate friend of Petrarch. He wrote two chronicles of Venice, and was doge, 1343–54.

DAN'DOLO, VINCENZO, Count, 1758–1819; an Italian scientist, native of Venice, where he began life as a physician. When Venice came under Austria, he went to Milan, where he became a member of the grand council. He went to Paris in 1799, but soon afterwards returned to the vicinity of Milan and engaged in scientific agriculture. In 1805, Napoleon made him governor of Dalmatia, where he proved himself an excellent officer. He published several works on agriculture. In 1809 he retired to private life in Venice.

DANE, a co. in s. Wisconsin, intersected by several railroads, the co. seat (Madison) being the capital and the great railroad centre of the state; 1200 sq. m.; pop. '90, 50,578.

DANE, NATHAN, LL.D., 1752–1835; b. Mass.; graduated at Harvard, 1778; studied law in Salem, and began to practice in 1782 at Beverly. He was successively a member of the Massachusetts house of representatives, the continental congress, and the Massachusetts senate; then held various commissions to codify or revise laws, and was judge of common pleas. He was also a member of the much abused Hartford conven-

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tion. He is credited with placing in the ordinance for the government of the northwestern territory the clause forever prohibiting slavery.

DAN'EBROG, ORDER OF, the second of the Danish orders, was instituted by king Waldemar in 1219. The word *brog* in old Danish signifies "cloth," and thus D. is equivalent to the cloth or banner of the Danes. The order is a sort of glorification of the old national flag of Denmark, which long floated, like the oriflamme of France, at the head of the army. It is meant to recompense services rendered to the state, whether civil or military, and irrespective of age or rank. The decoration of the order consists in a cross of gold *pattée*, enameled with white, and suspended by a white ribbon, embroidered with red.

DANE'GELT, or DANEGOLD, a tribute, first of 1*s.*, and afterwards of 2*s.*, levied on every hide of land by the Anglo-Saxons, for the purpose of meeting the outlay requisite for defending the country against the Danes. The tax was continued after the conquest, as one of the rights of the crown, till the time of Stephen.

DANE-LAGE, or DANE-LAW. After the overthrow of the Danes under Guthrun at Ethandune by king Alfred (878 A.D.), a treaty was concluded between the two, in virtue of which the entire kingdom of Wessex, from Somerset to Kent, was evacuated by the Danes, who were, however, allowed to retain the greater part of the east coast of England, including the whole of Northumbria. This district was called Danelagh or Dane-law (which name it retained down to the Norman conquest), because the inhabitants were ruled by Danish and not by English law.

DANENHOWER, JOHN WILSON; b. Chicago, 1849; graduated at the U. S. naval academy, 1870; served two years in the European squadron in the *Juniata*, and two years on an exploring and surveying expedition in the *Portsmouth;* was lieut. on the *Jeannette*, which set sail from San Francisco, 1879, July 8, for the open polar sea. The ship sank, 1881, June 13, in latitude 77° longitude 157° e., near Henrietta island. The crew started southward over the ice and reached Bennett island, July 27. By means of sleds and boats they worked towards the Siberian coast, and the whale-boat containing Danenhower with ten others reached one of the eastern mouths of the Lena delta, Sept. 17. After an ineffectual search for the missing boats' crews, Danenhower made his way to Yukutsk, whence he desired to return to continue the search, but on account of his ophthalmia was recalled in 1882, Feb., and reached New York in May. He d. 1887. See his *Narrative of the Jeannette* (1882).

DANIEL, a Hebrew prophet, who flourished about 600 B.C. He was a contemporary of Ezekiel, and was carried captive to Babylon in the fourth year of Jehoiakim. He was one of the youths selected to be brought up for future service at the court of the conqueror, and received instruction in all the learning of the Chaldeans. His skill in the interpretation of dreams procured for him the royal favor. He rose to be governor of the province of Babylon under Nebuchadnezzar; and under Darius, the Mede, to be first president of the whole Medo-Persian empire, a dignity only inferior to that of Darius himself. The time and the place of his death are alike unknown. He was alive, however, in the first year of the reign of Cyrus, but did not return to Judea with his countrymen on their release from captivity. Epiphanius and others affirm that he died at Babylon; but the common tradition is that he expired at Susa or Shusan in Persia, when upwards of ninety years of age; and at the present day, a tomb bearing his name is the only standing building among the ruins of that ancient city. D. was the only one of the Hebrew prophets who enjoyed a high degree of worldly prosperity. Ezekiel mentions him as a model of wisdom and piety.—The book of D. consists partly of historical notices of D., and partly of visions and prophecies, some of which are written in Chaldee. The genuineness of the book, in its present form, has been much disputed in recent times.

DANIEL, HERMANN ADALBERT, 1812-71; a German geographer and theologian, educated at Halle, and subsequently became a professor at that university. He was one of the most eminent followers of the geographer Ritter.

DANIEL, JOHN WARWICK; b. Lynchburg, Va., 1842; son of Judge D. He entered the confederate service as a private, and rose to the rank of col. After the war he became distinguished as a lawyer and orator. He was a conservative candidate for gov. 1877 and 1881; was member of congress, 1885–87; elected U. S. senator, 1887 and 1891.

DANIEL, BOOK OF, derives its name from the chief person whose history it narrates, and who is generally regarded as its author. The close correspondence of its predictions with historical events has, indeed, led some writers to assert that it was written by some unknown person about 175 years B.C. Porphyry, in the 3d c., held this opinion, and, in modern times, Collins, De Wette, and others. Among the answers to them are: 1. That however plausible, in Porphyry's day, the assertion may have seemed that the so-called predictions of the book were written after the events in the life of Antiochus, to which some of them refer, there is no force in it now, after the progressive accomplishment, which has since been witnessed, of many predictions then unfulfilled. 2. The first book of Maccabees refers to the book of D. in the same manner

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as to other books of the Old Testament: saying that the enemies of the Jews "set up the abomination of desolation upon the altar;" that "Ananias, Azarias, and Misael, by believing, were saved out of the flame," and that "Daniel, for his innocency, was delivered out of the mouth of lions." 3. It was translated into Greek, B.C. 280–250, before the date which Porphyry assigned to it. 4. At a still earlier date it was received into the Hebrew canon. 5. Its diction, partly Hebrew and partly Chaldaic, proves that its author was master of both languages; its acquaintance with Chaldean manners, customs, and religion, indicates his long residence in the midst of them; and its descriptions of public affairs after the conquest by the Medes and Persians could have been given only by one who had full knowledge of the conquerors and was in favor with them. Daniel, a Jew of noble birth, familiar with the Hebrew as his native tongue, educated from his youth in all that the Chaldeans could teach, and high in office and favor with the successive kings through the whole captivity of 70 years, fulfills all these conditions, and he alone. 6. The great favors which Alexander, in the midst of his career of conquest, conferred on the Jews at Jerusalem, are rationally accounted for by the statement in Josephus that when, at the temple, the book of Daniel was shown to him, wherein Daniel declared that one of the Greeks would destroy the empire of the Persians, he supposed himself to be the person intended, and in his joy called on the people to ask of him any favors which they chose. 7. The testimony of Christ is emphatically given to the book of Daniel, to its prophetic character, and to the approaching fulfillment of things written therein. Its place in the Hebrew canon is not among "the prophets" strictly so called, but in the same division with "the Psalms." The prophets were God's ministers among the people at large to instruct, comfort, and reprove, as well as to foretell the future. Daniel's office, as has been seen, was rather that of a statesman, clothed with vice-royal authority by the kings who held him captive and made conspicuous by the manifest wisdom and power of God. He ranks with Moses and David rather than with Isaiah. His personal prosperity, the miracles wrought around him, and the revelations given him, were designed to show, among other things, that although God had allowed the Jews to be carried captive for their sins, his power, as great as it ever had been, was concentrated on Daniel as their representative, and as a pledge that he would restore them to their own land. Their release by Cyrus at the end of their 70 years is without rational explanation if Daniel's life and influence as described in the book are stricken out. The book is partly historical and partly prophetical; and portions of the history are prophecies fulfilled.

I. The historical part narrates: 1. The captivity of Daniel and his three friends, their education at the court of the king, and their superiority over the rest of the Hebrew youth. 2. The king's dream, Daniel's interpretation of it, and the consequent exaltation of him and his friends. 3. The golden image, the fiery furnace, and the deliverance. 4. The king's second dream and its interpretation, his pride, loss of reason, expulsion, and restoration. 5. Belshazzar's feast, the writing on the wall, the doom declared, the city captured, and the king slain. 6. Daniel's exaltation in the kingdom of Darius, the conspiracy against him, the den of lions and his safety there. 7. His prosperity continued during the reign of Cyrus. II. The prophecies in the book are: 1. Concerning the four kingdoms under the emblem of the image in Nebuchadnezzar's dream: its *golden head* representing the Babylonian; its *silver arms and breast*, the Medes and Persians, becoming one; its *brazen loins and thighs*, the Grecks under Alexander, divided after him into two eastern kingdoms, Egypt and Syria; its *iron legs*, the Romans, consisting of two parts—the senate and people, and led by two consuls; its *toes of iron and clay*, the kingdoms of Europe, having both the strength of Rome and the weakness of barbarous tribes; the *stone cut out without hands and smiting the image*, the kingdom of Christ commenced and advanced without human power and destined to subdue the world and continue forever. 2. These kingdoms were represented again in Daniel's vision by four wild beasts coming out of the sea, and explained by the angel as denoting four kingdoms rising out of tumults and wars: (1) The lion with eagle's wings was an emblem of Babylon; (2) The bear with three ribs between its teeth denoted the Medes and Persians conquering Babylon, Lydia, and Egypt; (3) The leopard with four wings and four heads represented the kingdom of Alexander, famous for the swiftness with which it was conquered, and divided after his death into four parts; (4) The fourth beast was great, terrible, and strong, and represented the fourth kingdom, diverse from all others, devouring the whole earth, treading it down, and breaking it to pieces; but finally to be judged and destroyed, and to be followed by the kingdom of the Most High that shall endure forever. 3. The vision of a ram, attacked by a goat rushing from the w. without touching the ground, represented the kingdom of the Medes and Persians overthrown by Alexander advancing from Macedonia with unequaled swiftness. When the goat was strong its horn was broken, and in its place came up four, pointing towards the four winds. And when Alexander was at the height of his power he suddenly died, and four kingdoms were formed out of his dominions. 4 The prophecy concerning the 70 weeks—interpreted as 490 years, each day signifying a year—revealed to Daniel by the angel Gabriel, measured off the time between the going forth of the commandment to rebuild Jerusalem and the coming and death of the Messiah. This period is subdivided into three—7 weeks, 62 weeks, and 1 week. During the *first* the city and wall would be rebuilt; at the end of the *sec-*

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ond the Messiah would come, and in the middle of the *third* he would be cut off. During the third period, both before his death and after it, he would establish the covenant with many; and afterwards desolation would come on the temple and city. 5. The final revelation given to Daniel was from the lips of the Son of God appearing in the similitude of a man. Beginning at the point of time where Daniel then stood, he numbered the kings of Persia who were afterwards to arise, announced the expedition of Xerxes against Greece, and gave a condensed summary of human history onward to the resurrection of the dead to everlasting life or everlasting shame.

DANIELL, JOHN FREDERICK, D.C.L., a distinguished English savant, was b. in London, Mar. 12, 1790. He was a pupil of Prof. Brande, along with whom he made several scientific tours; was elected a fellow of the royal society in 1814, and in 1816 started, in connection with prof. Brande, the *Quarterly Journal of Science and Art.* From this period, D. devoted almost the whole of his time to the subjects of chemistry and meteorology. In 1823, he published his *Meteorological Essays*, which is still the standard work on meteorology; and in 1824 the horticultural society awarded him their silver medal for his *Essay on Artificial Climate.* In 1831, he was appointed professor of chemistry in King's college, London; and in 1839 published his *Introduction to Chemical Philosophy.* In 1843, he received the degree of D.C.L. from the university of Oxford. He also enjoyed the great honor of being the only person who ever obtained all the three medals in the gift of the royal society. Besides his professorship in King's college, D. also held the post of lecturer at Addiscombe, and of examiner in chemistry to the university of London. He died Mar. 13, 1845. D.'s *Meteorological Essays* was the first attempt to account, in a truly philosophical manner, for the known phenomena of the atmosphere. Besides the works mentioned, D. wrote a large number of interesting and valuable papers for the royal society. For an account of his new hygrometer, see HYGROMETER.

DANIELL, THOMAS, 1749–1840; an English landscape painter. He made a journey through India, taking a great number of important sketches. He published *Views of Calcutta; Oriental Scenery* (144 plates); *Views in Egypt; Picturesque Voyage to China*, etc. He was a royal academician and fellow of several other societies. His nephews, William and Daniel, were also artists of repute, the former assisting in the India sketches, and the latter spending many years in Ceylon.

DANIELSON, Ct., a borough of Killingly (q. v.).

DANISH LANGUAGE AND LITERATURE. The Danish language, which, with slight modifications, is common to the three Scandinavian kingdoms, is a branch of the ancient Gothic, and has been retained almost in its original form in Iceland. The oldest memorials of the Danish are codes of laws, as the *Skaanske Lov*, and the old and new *Sjællandske Lov*, promulgated by Valdemar the great in 1162 and 1171; but these, no less than the writings of Harpestreng, canon of Roeskilde (1244) already show marked deviations from the Icelandic, in consequence of the intermixture of the Anglo-Saxon, English, and Norman elements, due to the Danish occupation of England, and the immigration of monks and artisans into Denmark from Britain. The influence of the English dialect was again modified towards the close of the 12th c. by the influx of Germans into the country. Saxo Grammaticus, the father of Danish history, who died in 1204, wrote, like almost all his ecclesiastical brethren at that day, in Latin, as did also his contemporary, the knight Svend Aagesen. The Danish *Kæmpeviser* are the richest poetical remains of the folk-lore of the middle ages in Europe, and consist—1. Of narratives and songs of giants, demigods, and other supernatural creatures of the Scandinavian mythology; 2. Of romantic songs and tales connected with these mythical beings; and 3. Of historical verses, referring to a later period. The names of the writers are unknown, and these compositions seem rather to be the expression of the entire people than the production of individual poets. Many have, from time immemorial, been associated with certain national melodies, which have secured them a permanent place in the hearts of the people, whose disposition leads them to dwell with fondness on the memory of by-gone times and events, and to seek in the glory of the past a compensation for the national humiliation and reverses of the present. The first printed collection of the Kæmpeviser is due to the royal historiographer, Vedel, and appeared at Ribe, 1592; another edition (Copenh. 1695) by Peter Syv found its way to almost every peasant's cottage; but the most complete of any is probably that by Nyerup and Rabek, in 5 vols. (Copenh. 1810–14). After the reformation, the national literature was comparatively neglected, for the composition of poor theological treatises and bald versions of the Psalms. Among the best of the writers in this department we may instance Christian Pedersen (born 1480), who, after having made a metrical version of the ancient national chronicles, devoted himself to the diffusion of the Lutheran faith, and made Danish translations of the New Testament, and the reformer, Hans Taussen (born 1494), who composed catechisms, and translated the Pentateuch into Danish. The Danish language acquired stability and new life by the translation of the whole Bible, which, by order of king Christian III., was effected in 1550 by Palladius and other professors of the university. The close of the 16th c. was memorable for the many admirable writers on history which it produced in Denmark. Among those who edited and annotated the ancient Danish and Icelandic historical chronicles, we may mention Peder Claussen, A. S. Vedel, and Axil Hvitfeldt, whose respective works supply invaluable materials to the historical inquirer. These men were contem-

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poraries of the great astronomer, Tycho Brahé, and, like him, experienced the caprices of court-favor. The 17th c. shows a large number of able writers, among whom were Longomontanus, the pupil of Tycho Brahé; the family of Bartholin, numbering seventeen in three generations, who were all known for the ability of their writings on medical, philosophical, and mathematical subjects in Latin, German, and Danish; the family of the Pontoppidans, eleven in number, all of whom have left memorials of their proficiency in philology and history, and of their acquaintance with the theology and natural history of the times; Arreboe, the father of Danish poetry, who wrote on sacred subjects, and in his principal work, *Hexameron*, described in epic verse the events of the first six days of creation; Steno, the anatomist, and the lyrical poet, T. Kingo. A new era began with the genial and versatile Ludvig Holberg (born 1684), who wrote in Latin, French, German, and Danish, and has left very numerous works on history, biography, and topography, but whose fame among his countrymen will ever rest on his inimitable comedies, farces, and satirical compositions His genius and his writings gave an impetus to the cultivation of the Danish language, which not all the studied neglect of the court-party, and their persistence in the use of German, could check. The 18th c. produced many good historical critics—as, for instance, Torfæus, Langebek, Schöning, and Suhm, Magnæus, the Icelandic scholar, Thorlacius, and Thorkelin, learned in ancient northern lore, and Rosenvinge, the jurist. Among the epic and dramatic poets of that age, Ewald stands foremost, whose national lyrics evince true poetic genius. The close of the century was, however, unfavorable to mental development and freedom of thought; and the best writers, as in the case of Malte Brunn and the poet Heiberg, were either compelled to leave the country, or to abstain from giving expression to their opinions. Among the more recent writers, we may instance the poet Oehlenschläger—whose national tragedies and lyrical legends of Scandinavian mythology have rekindled all the long slumbering fire of Danish patriotism—Baggesen, Winther, Hauch, F. P. Müller, Heiberg, Hertz, H. C. Andersen, Rosenhoff, Holst, and Overskou. Ingemann, who stands first as a writer of historical novels, also wrote good lyrics, and his subjects were generally taken from the national history. Short tales or novelettes would seem, however, to be more congenial to the taste of the Danes, and most of their best writers of fiction have adopted this form—as, for instance, Blicher, Heiberg, Trane, Andersen, Winther, Carit Etlar, etc. The names of Oersted, Schouw, Forchhammer, Rask, Finn Magnussen, Worsaa, Grundtvig, Petersen, and Eschricht, sufficiently attest the stand that the physical sciences, philology and archæology, have attained in Denmark in the present day. Thorwaldsen, by the gift of his works to the nation, has created a taste and appreciation for sculpture and the arts generally among his countrymen, to which they were previously strangers, and has thus given a new direction to the mental culture of the Danes.

The Danish language is peculiarly soft, from the great number (ten) of distinct vowel-sounds which it contains, the absence of gutturals, and the softening of all the consonants. It may be said to bear the same relation to the ancient tongue, the *Norræna* or *Dönsk Tunga*, that Italian does to Latin, force and precise inflections having been sacrificed for melody and simplicity.

DANISH POLITICAL PARTIES. See POLITICAL PARTIES, DANISH.

DANITES, THE, are a secret order among the Mormons suspected of having committed many murders for the purpose of avenging wrongs perpetrated against the Saints. They are supposed to have been organized by Sidney Rigdon and Dr. Sampson Avard, and to have chosen their name from Genesis 49 : 17. The Mormons have always denied the existence of such a body.

DANNECKER, JOH. HEINR. VON, a German sculptor, was b. at Waldenbuch, in the district of Stuttgart, 15th Oct., 1758. His parents were in the humblest circumstances; but through the favor of the duke of Würtemberg, he received a good education at the military academy at Ludwigsburg. His artistic talents were rapidly developed. In 1780, he obtained the prize for the best model of "Milo of Croton destroyed by the Lion;" and in 1783, went to Paris, where he studied for two years under Pajou; after which, he proceeded to Rome, where he met with Goethe, Herder, and Canova, to the last of whom he was indebted for much valuable instruction in his profession. At Rome, D. remained till 1790. Here he executed in marble his statues of "Ceres" and "Bacchus." On his return to Germany, the duke of Würtemberg appointed him professor of sculpture in the academy of Stuttgart, in which city he resided till his death, 8th Dec., 1841. D. was undoubtedly one of the best of modern sculptors. His forte lay in expressing individual characteristics, in which respect he has not been surpassed. This gives a great value to his busts of distinguished persons, such as Schiller, Lavater, Gluck, and the kings Frederick and William of Würtemberg. His perceptions of the beautiful and the delicate, especially in the female form, are also considered by his countrymen to be more exquisite and true than those of Canova himself. His earlier works are chiefly pagan in their subjects, while his later ones are Christian, and are pervaded by a pensive idealism. Of the former, besides those already mentioned, the principal are "Sappho," "Love," "Psyche," and "Ariadne as the Bride of Bacchus riding on a Leopard (at Frankfort);" of the latter, "Christ" and "John the Baptist."

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DANNEVIR'KE, a wall of defense against the Franks, built by the Danes in 808 A.D., reaching from the North sea to the Baltic During the troubles of 1848, the line of the old wall was strongly fortified, but the works were destroyed in 1864.

DAN RIVER, rising in the Blue Ridge in Virginia, passing through a considerable portion of that state into North Carolina, several times crossing the state boundaries, and finally uniting with the Staunton river in Virginia to form the Roanoke. It has a length of about 200 m., and is in some parts navigable.

DAN RIVER, a magisterial dist., Pittsylvania co., Va. Pop. 8857.

DANSVILLE, a village in Livingston co., N. Y., on the Dansville and Mt. Morris, and the Delaware, Lackawanna, and Western railroads, 38 m. s. of Rochester. Population '90, 3758. The village is in a fertile district, and manufactures paper, chairs, pails, agricultural implements, and flour, and has extensive nurseries and vineyards, Union School library, high school, national bank, and several weekly newspapers. Among the institutions are a sanitarium, established about 1860.

DAN'TĒ (properly, DURANTE) **ALIGHIE'RI**, one of the greatest poets of all time, and incomparably the greatest among the Italians, was b. in Florence in 1265. The outward circumstances and fortunes of his life are involved for the most part in great uncertainty. His family was, by his own account, one of the most illustrious in the city. His father dying while D. was young, his education devolved upon his mother, Bella. In this duty, in which she displayed great fidelity and judgment, she seems to have been counseled and aided by the great statesman, scholar, and poet, Brunetto Latini. The elements of knowledge D. probably acquired in Florence; in riper years, he studied philosophy at Bologna and Padua. After his banishment, he pursued theology for a time at Paris, and, if Boccaccio were to be believed, even visited England. His studies, however, did not prevent him from discharging the public duties of a citizen. He fought in the successful battle with the Aretines at Campaldino in 1289, and was present at the taking of the fortress of Caprona, 1290. What civil offices he first held, we do not know, but it is certain that he was sent on several embassies, and at last, in 1300, rose to the highest dignity of the city, being chosen one of the Priori for two months, an office which was the source of his subsequent unhappy fortunes. Florence, on the whole, belonged to the party of the Guelphs (q.v.), but was divided into the two factions of the Neri and Bianchi (the *blacks* and *whites*). The Neri were the unconditional adherents of the pope, and this of course gave to the other faction a more Ghibelline leaning. See GUELPHS and GHIBELLINES. A tumult in the city, occasioned by the heads of the ultra-Guelphic or *black* party, caused their temporary expulsion from Florence. They hurried to Rome, to lay their complaints before his holiness. D., who belonged to the Bianchi, was sent by his party to Rome, to counteract their machinations; but Boniface VIII., in concert with the Neri, got Charles of Valois, brother of Philip IV. of France, to come to Florence and restore peace under the title of peacemaker. This explains the deadly enmity of D. to Boniface. The peace established by Charles of Valois consisted in recalling the banished leaders of the Neri, in giving up the houses and property of the Bianchi to be plundered, and banishing many of them, and among others Danté. D. never entered his native city again, and his whole subsequent life was unsettled, spent in various places, and under various protectors, at Arezzo, Verona, Padua, etc. In 1304, the Bianchi made a final attempt to return to Florence by force of arms, which failed; and it was probably on this occasion that D. went to Paris. The march of Henry VII. to Rome in 1310 recalled him to Italy, and he endeavored, by addressing ardent letters to the Italian princes, to promote the cause of the empire, which had now become his own. It was probably with this view and at this time, that his work *De Monarchia* was written. The unsuccessful siege of Florence, and the death of the emperor, which followed in 1313, annihilated the last hopes of D., and he spent the closing years of his life at Ravenna, under the protection of Guido Novello da Polenta. He went on a mission for this prince to Venice, returned sick, and died on the 14th Sept., 1321.

As not unfrequently happens with distinguished men, an accidental circumstance in D.'s early youth had made an indelible impression on the soul of the poet, and, as he himself expresses it, awaked in him a "new life." At a family festivity, he had seen Beatrice Portinari, then eight years old, the daughter of a rich citizen, and the love that sprang up in the heart of the nine years' old boy became the fountain of the poetical inspiration of his life. How pure, chaste, and tender this love was, is testified by the *Vita Nuova*, his first work, which appeared about 1300. It is a collection of poems or canzoni, bearing upon this youthful love, and along with each piece is given a history of its origin and a minute analysis. The best edition of this collection is that prepared by the marquis Trivulzio (Mil. 1827). Beatrice married a nobleman, Simone de Bardi, and died young about 1290. D. himself afterwards married a lady named Gemma, of the powerful house of Donati.

His immortal work, the *Divina Commedia*, depicts a vision, in which the poet is conducted first by Virgil, the representative of human reason, through hell and purgatory; and then by Beatrice, the representative of revelation; and finally by St. Bernard, through the several heavens, where he beholds the triune God. The name *Commedia* was given to the work by the poet himself—because, beginning with the horrible, it ends cheerfully; and because, in respect of style, it is lowly, being written in the vulgar tongue. The epithet *Divina* was added by the admiration of after-times. Hell is

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represented in the poem as a funnel-shaped hollow, formed of gradually contracting circles, the lowest and narrowest of which is at the earth's center. Purgatory is a mountain rising solitary from the ocean on that side of the earth that is opposite to us; it is divided into terraces, and its top is the terrestrial paradise, the first abode of man. From this, the poet ascends through the seven planetary heavens, the heaven of the fixed stars, and the "primum mobile," to the empyrean, or fixed seat of God. In all parts of the regions thus traversed, there arise conversations with noted personages, for the most part recently deceased. At one time, the reader is filled with the deepest sorrow, at another, with horror and aversion; or the deepest questions of the then philosophy and theology are discussed and solved; and the social and moral condition of Italy, with the corruptions of church and state, are depicted with a noble indignation.

Fifty-two years after the poet's death, the republic of Florence, at the instigation of Boccaccio, set apart an annual sum for public lectures to explain the *Divine Comedy* to the people in one of the churches, and Boccaccio himself was appointed first lecturer. The example was imitated in several other places of Italy. The works of these men are among the earliest commentaries on D. that we possess. The number of editions of the work amounts by this time to about 300. Only a few, in addition to the commentaries above mentioned, deserve notice. They are: that printed at Fuligno in 1472—the earliest of all; the Nidobeatine edition at Milan (1478); the first Aldine edition (1502); the first Cruscan edition (1695); that of Volpi (1727); of Venturi (1732); of Lombardi (1791), and with additions and illustrations in 1815, 1821, and 1822; of Dionisi (1795); of Ugo Foscolo (Lond. 1842–43). A reprint of the Fuligno edition above mentioned, together with those printed at Jesi (1472), at Mantua (1472), and at Naples by Francisco del Tuppo (about 1478), appeared at London, in 1858, under the superintendence of sir Antonio Panizzi, and at the expense of lord Vernon.

The *Divina Commedia* has been translated into almost all European languages. Two translations of the whole into Latin have been printed, one by Carlo d'Aquino (1728), and lately by Piazza (1848). In French, there are a number of translations both in prose and verse. The earliest, by Grangier, in 1596, is still the nearest to the original in form, but none is good. The German translations are numerous, and such as no other modern language can equal in faithfulness. Kannegiesser has translated the whole in the measure and rhyme of the original (4th edition, Leip. 1843); king John of Saxony's translation is said by some to be the best. The chief English translations are Boyd's (1785) and Cary's (1814), in blank verse (see "Chandos Classics," London, Warne & Co.); Wright's (1833), in triple rhymes; Cayley's, in the original ternary rhyme (the *Inferno*, 1801, the *Purgatory*, 1853, the *Paradiso* in 1854, with notes in 1855); Dr. John Carlyle's, the *Inferno*, in prose, with commentary (1849); Fred. Pollock's, in blank verse (1854); H. W. Longfellow's (1867), in blank verse, with D.'s ternary arrangement of lines. See Maria Rossetti's *A Shadow of Dante*.

DANTON, Georges-Jacques, was b. at Arcis-sur-Aube, 28th Oct., 1759. At the outbreak of the French revolution, he was practicing as an advocate in Paris, but did not enjoy much reputation, on account of his dissolute habits. The fierce half-savage nature of the man, however, immediately found a fitting sphere for its action in the chaos into which France then fell. Mirabeau quickly detected his genius, and hastened to attach D. to himself. President of the district of the Cordeliers, D. ruled it at his will. Along with Marat and Camille Desmoulins, he instituted the Cordeliers' club, an exaggerated copy of that of the Jacobins. It soon became the rallying-point of all the hotter revolutionists. There the tall brawny man, with harsh and daring countenance, terrible black brows, and a voice of enormous power, thundered against the aristocrats, till the passions of the populace rose into ungovernable fury. It was not, however, till after the flight of Louis that the political *rôle* of D. commenced. On the 17th July, 1791, he and others assembled the people of Paris in the Champ-de-Mars, and goaded them on by furious declamation to sign a petition for the deposition of the king. Some time after, he became *procureur-substitut* for the city of Paris. The court, which found that it could not frighten D., now attempted to bribe him. It is not certain that he proved venal, but the evidence undoubtedly leaves a strong suspicion of his venality on the mind. Be that as it may, he soon broke off his secret intercourse with the royalist agents, and became more the implacable enemy of the monarchy than before. It was D. who excited to action the wild sanguinary rabble that, on the 10th of Aug., 1792, stormed the Tuileries, and butchered the faithful Swiss. The reward of his fatal eloquence was the office of minister of justice, and here the gigantic personality of the man seemed to overshadow all the surrounding figures. He stood forth as the incarnate spirit of the revolution, manifesting alike its heroic audacity in the presence of danger from without, and its maniacal terror in the presence of danger from within. The advance of the Prussians seemed for a moment to inspire France with a panic. On the 2d of Sept., D. mounted the tribune, and addressed the legislative assembly in a speech of tremendous power, probably the most effective delivered during the whole of the revolution. It closed with these words regarding the enemies of France: "Pour les vaincre, pour les atterrer, que faut-il? De l'audace, encore de l'audace et toujours de l'audace." France quivered to its core with enthusiasm. "In a few weeks, 14 republican armies stood upon the field of battle, and repelled with unexampled bravery the

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aggressions of the allied forces." But unhappily that "audacity" by which alone D. thought it possible for France to save herself, required for its perfection the immolation of the imprisoned royalists. On the very evening when D. spoke, the frightful Sept. massacres began. D. publicly thanked the assassins, "not as the minister of justice, but as the minister of the revolution." Elected by the city of Paris one of its deputies to the national convention, he resigned his judicial function, and zealously hurried on the trial of the king. As a proof of his ferocious decision of character when pressed by difficulties, it is recorded that one of his friends having pointed out that the convention could not *legally* try the king, "You are right," instantly replied Danton. "So, we will not try him; *we will kill him!*" In the mean time, D. was sent on a mission to the army of the north, commanded by Dumouriez, with whom he was soon on very close terms of intimacy—too much so, indeed, for the suspicious soul of his old friend Marat. The defection of Dumouriez was the signal for Marat to give vent to his suspicions. It therefore became necessary for D. to throw himself again into the van of the revolutionary movement. On the 10th Mar., 1793, he established the "extraordinary criminal tribunal," which was at liberty to make what arrests it pleased, and from whose deadly decisions there was no appeal. He also became president of the "committee of public safety." D. now set himself to crush the Girondists, or moderate party, alleging, with singular candor, that "in a revolution the authority ought to belong to the greatest scoundrels." In this he was supported by Robespierre, now gliding into power swiftly and silently like a serpent. After he had effected his purpose, however, a species of remorse seems to have seized him. He objected to the institution of the guillotine. This trait of moderation lost him the favor of the Jacobins or mountain party, whose murderous instincts led them to select Robespierre as a chief, on the permanence of whose cruelty more reliance might be placed. Several other indications of returning humanity lessened his influence still more, and at the close of 1793, D. felt that a crisis was approaching. A fruitless attempt was made to reconcile Robespierre and him. They had an interview, but parted on worse terms than ever. It was now a struggle for life between them; but D., sick of the revolution, and conscious that it was rapidly becoming a *sham* (a thing which D., with all his faults, could not abide), gave himself up to a sort of reckless apathy, which enabled the sleepless Robespierre to ruin him. His friends endeavored to rouse him. "I would rather be guillotined than guillotine," he answered. Blinded by the consciousness of his own inherent power, he also declared that his enemies "would not dare" to lift their finger against him. But men of the stamp of Robespierre—though essentially cowards, and incapable of facing danger with honest straightforwardness—have a certain furtive audacity that emboldens them to attack a greater than themselves, if circumstances are favorable. So Robespierre sprang at D., and so the great anarch perished. On the night of the 30th Mar., 1794, he was arrested, and brought before that revolutionary tribunal which he himself had established, summarily condemned, and, along with Camille Desmoulins and others, was guillotined on the 5th of April. He predicted the fate of Robespierre, calling him "an infamous poltroon," and immediately added, "I was the only man who could have saved him." D. was an atheist—not a calm, thoughtful dispassionate disbeliever in the existence of God, but one who, by his own vices, and the general godlessness of the times in which he lived, had been robbed of the spirit and power of faith in the Unseen. When formally interrogated regarding his name and dwelling, he replied: "My dwelling-place will soon be in annihilation, and my name will live in the pantheon of history."

DANTZIG. See DANZIG.

DAN'UBE (Ger. *Donau*), the second of European rivers, inferior only to the Volga, has its origin in the Brege and Brigach, two mountain-streams rising in the eastern part of the Black Forest, in Baden, at an elevation of 2,850 ft. above sea-level in lat. 48° 6′ n., and in long. 8° 9′ east. The total length of the D. is about 1750 m.; the area which it drains is estimated at 250,000 sq.m., comprising countries widely varying in climate and productions. The average fall of the D. is 18 in. per mile. At Ulm, it attains a breadth of 108 ft., and before its junction with the Sereth the mean breadth is 6,000 ft., and the depth, which at Ulm is 6 ft., and at Passau 16, is here on an average 20 feet. The D. is joined in its course by sixty navigable rivers, and falls into the Black sea, pouring into it a volume of water nearly equal to that of all the other rivers that empty themselves there. From its source it flows in a north-easterly direction through Würtemberg and Bavaria. Passing Ulm, at which point the river becomes navigable for vessels of 100 tons, it receives from the s. the Lech and the Iser, with some unimportant streams from the n.; flows rapidly past Ingolstadt, and onwards to Regensburg (Ratisbon); then suddenly altering its course, it proceeds in a south-easterly direction, passing Straubing and Passau, where it enters the Austrian dominions. With little variation of course, the D. flows eastward from Passau to Presburg, receiving from the s. the Inn and the Ens, and from the n. the March or Morava, through a tract of country rich in minerals, well peopled, and highly cultivated. Near Linz, and also in the picturesque neighborhood of Vienna, the waters of the D. frequently divide, and inclose large tracts of soil, forming islands, among which are the Great and Little Schütt, called also the "Golden Gardens." Hurrying past Presburg, the D. alters its course to s.e., and such is its velocity here, that barges can only navigate it downwards. Passing Pesth, and

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flowing directly s., it enters upon the Hungarian plain, a vast sandy and alluvial flat, in which it is continually forcing new channels and silting up old ones, sometimes sweeping away towns, or capriciously removing its waters to a distance of several miles from such as were formerly built upon its banks. Here it receives from the n. the Waag and the Gran, while the Drave from the w. adds considerably to its volume. After this accession the river turns towards the e., and, joined by the waters of the Theiss and Temes from the n., sweeps past Belgrade, forming the boundary between Servia and Hungary. Still flowing eastward, the D., leaving Orsova, passes the famous "Iron Gate," a broad plateau of rock 1400 yards wide, over which the water formerly rushed with an overpowering noise. This rapid, which was followed by a series of whirlpools, eddies, and shallow falls, formed an effectual bar to the upward progress of vessels, no craft drawing more than 2½ ft. of water being able to pass it. In 1847–49, however, the obstruction formed by the "Iron Gate" was to some extent removed by blasting, and since then great improvements have been made in this part of the course, the Austrian government in 1890 having begun works for making the river constantly navigable at the "Iron Gate." The new passage was formally opened Sept. 27, 1896. A few miles further on, it enters a plain, and, proceeding uninterruptedly, forms the boundary between Wallachia and Bulgaria. From the Carpathians it receives the Schyl and the Aluta, and from Mt. Balkan the Morava. Increased by these rivers and by numberless streams, it progresses through a district fertile indeed, but badly cultivated and thinly peopled, occasionally broadening like a sea, as at Hirsova, and encircling many islands. After being joined by the Serith and the Pruth from the n., and after dividing into several branches forming deltoid islands, it flows eastward into the Black sea. The principal mouth is the Sulina, by which the greater number of ships enter. The D., which is the chief natural highway for European commerce, is throughout the greater part of its course surrounded by picturesque and impressive scenery. At the peace of Paris, in 1856, the navigation of the D. was declared free to all nations, and its management was intrusted to two commissions, one representing the European powers, another named by the states on the banks of the river. At the Berlin congress of 1878, it was stipulated that no ships of war should navigate the D. below the Iron Gate. The navigation is under the direction of a mixed commission composed of representatives of the riparian powers. From 1869 to 1881 the Austrian government rectified the channel opposite Vienna. The Danube steam navigation company, has done much to increase the commerce.

DANU'BIAN PRINCIPALITIES. See MOLDAVIA AND WALLACHIA.

DANVERS, a town in Essex co., Mass., 5 miles n.w. of Salem; on the Boston and Maine railroad. It contains several villages, and has electric cars to Peabody, Salem, and Marblehead. In 1852, George Peabody, who was a native of this town, gave a sum finally amounting to $200,000 for the promotion of knowledge and morality among the inhabitants, which was the foundation of the Peabody institute. The town was incorporated in 1752, and has manufactories of shoes, bricks, morocco, and tanned leather, a state insane asylum, and public library. Pop. '90, 7454.

DANVILLE, a city and co. seat of Vermilion co., Ill., on Vermilion river, 16 m. above its junction with the Wabash; connected by railroads with all parts of the country; 125 m. s. of Chicago; pop. '90, 11,491. Coal-mining is the chief industry. There are factories, car shops, public parks, library, and fine schools.

DANVILLE, city and co. seat of Boyle co., Ky., on a branch of Dick's river; connected by rail with Louisville and Nashville; 42 m. s. of Frankfort. It is a stock-raising district, and is the seat of Centre (Presbyterian) college, founded 1819, and Danville theological seminary (Presbyterian) founded 1853. Pop. '90, 3766.

DANVILLE, a borough and co. seat of Montour co., Penn., on the Susquehanna, 50 m. n.e. of Harrisburg. There are rich deposits of anthracite, limestone, and iron ore in the vicinity, and the borough has several blast furnaces, rolling mills, and other works. Pop. '90, 7998.

DANVILLE, a city in Pittsylvania co., Va.; on the Southern and several other railroads; 140 miles s.w. of Richmond. It contains churches, banks, the Danville Female college, Danville military institute, and Roanoke Female college, high school, a number of tobacco factories, cotton and flour mills, and daily paper. Pop. '90, 10,305.

DANZIG (Polish, *Gdansk*), an important seaport of Prussia, and fortress of the first rank, in the province of Prussia, is situated on the left bank of the western branch of the Vistula, about 3½ m. from its mouth in the Baltic. D. is an ancient place, having been in existence at least as early as the 10th c., and its possession was long an object of ambition to the Danes, Swedes, Pomeranians, and Teutonic knights, the last of whom obtained and held it for a considerable period. In 1454, it became a free city under Poland, and remained so until 1793, when it fell under the dominion of Prussia, in whose hands, except during the years 1807–14, when it existed as a separate dukedom under Napoleonic rule, it has since continued. During the Napoleonic wars it was twice besieged, first in 1807 when it was bombarded and captured by Marshall Lefèbvre, who in reward received the title of Duke of Danzig. The second siege was in the winter and spring of 1813 after the Russian campaign, when General Rapp held it against the allies until the end of the war. In 1814 it was restored to Prussia. D. is surrounded by ramparts and wet ditches, and is otherwise strongly fortified, and the garrison possesses the means of laying the surrounding country under water on three

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sides. The city is traversed by the Motlau and Radaune, tributaries of the Vistula, the former of which is deep enough to admit vessels of 8 or 9 ft. draught up to the town. The principal port, however, is at Neufahrwasser, at the mouth of the Vistula, which river cannot be entered by large vessels on account of the sand-bars across it. Many of the streets of D. are narrow and crooked, but the principal street, intersecting it from e. to w., abounds in fine specimens of antique architecture, and has altogether a most picturesque appearance. Among the most noteworthy buildings are the cathedral, a fine structure, commenced in 1343, but not finished until 1503, and possessed of a noble and widely celebrated picture of the "Last Judgment" (the painter of which is unknown), the church of St. Catharine, Trinity church, the fine old town-hall (which has been restored), the exchange, etc. D. was at one time a prominent member of the Hanseatic league, and is still one of the chief commercial cities of northern Europe. To provide for its immense trade in grain, it has enormous granaries, built on an island forming one of the parts of the town, where, in order to prevent fire, no person is permitted to live, nor lights allowed. It exports large quantities of timber and of grain from Poland, being the export centre for the products of the Vistula region; but its export trade has not its former importance, while on the other hand its manufactures have greatly increased. They include woolens, paper, beer, spirits, sugar, ironware, machinery, etc. The port has an imperial floating dock and a dry dock. In 1893 plans were formed for improving the anchorage. The inhabitants of D., of whom the majority are Protestants, numbered in 1895, 125,639.

DAOUDNUG'UR, a t. in Bengal, British India, stands on the right bank of the Son. D. is about 90 m. to the e. of Benares, being in lat. 25° 3′ n., and long. 84° 27′ east. It is a wretched-looking place, most of its thoroughfares being mere passages. It possesses, however, a considerable trade, manufacturing coarse fabrics both of wool and of cotton. Pop. '91, 9900.

DAOU'RIA, a country of Asia, in the Russian government of Trans-Baikal in Siberia. Its limits are not exactly defined. The Daourian mountains, offsets of the Yablonoi mountains, traverse it from n.e. to s.w., and separate it from the region of lake Paikal. The mountains are fertile in minerals.

DAPH'NÉ, a magnificent grove and sanctuary in ancient times, near Antioch (q.v.). The grove was finely laid out in walks of cypress and bay trees, and as the chief resort of all the dissolute persons in the city, became the scene of the greatest debauchery. In the center, surrounded by the luxuries of nature and art, glorious gardens, fountains, baths, colonnades, stood the temple of Apollo and Diana, which was invested with the privileges of an asylum, and became for centuries a place of heathen pilgrimage. The progress of Christianity gradually revived in the Antiochenes the purer instincts of virtue and decorum, and the grove was finally abandoned. Julian the apostate, in his vain endeavor to resuscitate the lifeless corpse of paganism, visited D., and made the altars of the temple smoke once more with incense; but on his departure, they were again neglected, until one night the altars and the statues were discovered to be in flames. They were consumed to ashes; and so perished forever the gods of Daphne.

D. owed its origin to Seleucus Nicator. He planted the grove, built the temple, and gave the place a mythological history in connection with the river Peneus and the nymph Daphne, who was here turned into a laurel or bay tree, whence the grove of D. received its name. Modern travelers are not agreed as to its site. Pococke and Richter decide in favor of *Beit-el-Maa*, about 5 m. from Antioch; while Forbiger and Kinneir consider Babylas the true position.

DAPH'NE, a nymph in Grecian mythology, of the woods some say, and some say of the water. She was pursued by Apollo, and prayed for help from her mother (the earth), whereupon the ground opened and she disappeared. From the place there grew a laurel, a tree sacred to Apollo, and to all poets and heroes.

DAPHNE, a genus of plants of the natural order *thymeleaceæ*, having a 4-cleft, funnel-shaped perianth, the throat of which is destitute of scales, eight stamens, and a one-seeded succulent fruit. All the species are shrubs or small trees, some having deciduous, and some having evergreen leaves, all of them possessing in all their parts a more or less considerable acridity, which in some is so great, that they are even caustic; and the berries are poisonous, whilst, however, the flowers of some are deliciously fragrant. To this genus belongs the DAPHNE MEZEREON, well known both for the fragrance of its flowers and for its medicinal uses, naturalized in some places of England. The GAROU bush (*D. gnidium*), a native of the s. of Europe, less hardy than the mezereon, has the same medicinal properties and uses, which is also in some measure the case with many other species. The only species certainly a native of Britain is the SPURGE LAUREL (*D. laureola*), an evergreen shrub, 3 to 4 ft. high, with obovate-lanceolate leaves, which grow in tufts at the end of the branches, and give it a remarkable appearance. It grows well under the shade of trees. It is naturalized, rather than a native of Scotland.—*D. Japonica*, a species recently introduced from Japan, has exquisitely lemon-scented leaves. From the bark of some species of D., and of the most nearly allied genera, paper is made in different parts of the east, particularly *Nepaul paper* from that of *D. cannabina*. Slips of the inner bark are boiled in a lye of wood-ashes for half an hour till quite soft, are then reduced to a homogeneous pulp by beat-

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ing with a wooden mallet in a mortar, churned with water into a thin paste, and poured through a coarse sieve upon a cloth stretched on a frame. The paper is subsequently polished by friction, with a shell or a piece of hard wood, and is remarkable for its toughness, smoothness, and durability. Most of the paper used in Thibet is made from the bark of different species of D. and allied genera, particularly of *Edgeworthia gardneri*, a beautiful shrub, with globes of waxy, cowslip-colored, deliciously fragrant flowers, growing on the Himalaya, at an elevation of 6,000 to 7,000 feet. The bark of *dais Madagascariensis* is also made into paper in Madagascar, and that of *gnidia daphnoides* into ropes.

DAPHNEPHO'RIA, a festival held once in nine years at Thebes in honor of Apollo. There was a procession in which the chief figure was a boy chosen for his beauty and strength, and having both parents living. Behind him moved a troop of maidens carrying green boughs and singing hymns to the god. The boy dedicated a bronze tripod in the temple of Apollo.

DAPH'NIA. See WATER-FLEA.

DAPH'NINE is a bitter, astringent, crystalline substance present in different species of *daphne*. It is analogous to asparagine. See ASPARAGUS.

DAPH'NIS, in mythology, a Sicilian youth of rare beauty, the son of Mercury and a nymph. He became a herdsman on Mt. Etna, where he won the love of a maid, who, for his supposed unfaithfulness, punished him with blindness. Thereupon his father carried him away to heaven. To Daphnis is ascribed the invention of bucolic poetry.

DA PON'TE, LORENZO, 1749–1838; an Italian poet, for many years a resident of New York, where he died. Exiled from Venice for writing a satirical poem, he went to Vienna, where he became one of the secretaries of Joseph II. There he wrote for the stage, among other works the librettos of *Don Giovanni* and *Le Nozze di Figaro*. After the emperor's death, he went to London, where he was secretary and poet of the Italian opera. In 1805, he emigrated to New York, where he taught Italian, and in 1828, was chosen professor of that language in Columbia college. He wrote memoirs of his life, a number of dramas, and translated various English works into Italian.

DARABGHERD', or DARAB', a t. of Persia, in the province of Farsistan, lat. 29° n., long. 54° 30' east. It is situated on a small river, in the midst of an extensive plain, and is surrounded by lemon and orange groves. At one time, it was a place of great extent and importance, but most of it is now in ruins, and its population is only about 12,000.

DARAGUNJ', a t. of India, in the British district of Allahabad (q. v.) on the left bank of the Ganges, opposite to Allahabad, with which it is connected by a ferry. The bed of the Ganges is here about a mile wide, two thirds of the width being occupied in the dry season with wet sand and mud, over which the passage is difficult. Pop. about 13,000.

D'ARBLAY, MADAME FRANCES, 1752–1840; daughter of Charles Burney (q.v.), an English professor of music. Frances taught herself to read and write. From her 15th year she lived in an exceptionally brilliant circle of literary men, musicians and actors. As her step-mother disapproved of her "scribbling," she burned all her manuscripts, among them a *History of Caroline Evelyn*, a story of which her first published novel *Evelina* was the sequel. About the same time (not much beyond her 15th year), she began her famous diary, which extended over a varied and interesting life of 72 years further. Her novel *Evelina, or a Young Lady's Entrance into the World*, was planned when she was about 16, written some years later, but not published until she was 26; and then by stealth. She disposed of it through her brother to Dr. Lowndes for $100, and did not herself know of its appearance until she saw an advertisement of it in the newspapers, after it had been everywhere commented upon with unqualified praise. The proud father, who had been in the secret, told it to Mrs. Thrale, and the authoress was at once admitted to the literary coterie of which Dr. Johnson was the center. The great lexicographer entertained a friendship for her which caused Boswell a jealousy as keen as it was absurd. Her *Cecilia, or the Memoirs of an Heiress*, was even more successful. In 1786, she obtained the position of second keeper of robes to queen Charlotte, wife of George III., and for five years her chief business was to assist the queen to dress, and look after her lap-dog and snuff-box, perhaps now and then to read to her. After five years she resigned, and in 1793, married M. D'Arblay, a French artillery officer. The next year her only child (who became the Rev. A. D'Arblay) was born. From 1802 to 1812, she was with her husband in France, and in 1814, published *The Wanderer, or Female Difficulties*. Her husband died in 1818. She was not remarkable for personal beauty; was small, retiring, rather prudish, delighting to be lionized, while she dreaded nothing so much as to be thought unfeminine or eccentric. Her novels are now not much read, but her *Journal and Letters*, full of egotism, are known everywhere. Her mania was to succeed as a dramatic writer, and Mrs. Siddons and Kemble appeared in one of her tragedies at Drury Lane in 1795, but the piece was a complete failure.

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DARBOY, GEORGES, 1813–71; a French Roman Catholic ecclesiastic, ordained a priest in 1836. In 1855, he became titular vicar-general of Paris. In 1859, he was appointed bishop of Nancy, and in 1863, advanced to archbishop of Paris, where he was in high favor with the court, being appointed grand officer to the legion of honor. He was a strenuous upholder of episcopal independence. At the Vatican council he maintained the rights of the bishops, and strongly opposed the doctrine of papal infallibility; but when it had been declared, he was one of the first to submit. During the war with Germany he was indefatigable in works for sick and wounded soldiers. He refused to leave his post during the siege, or to seek safety in flight during the brief triumph of the commune. On April 14, 1871, he was arrested by the communists as a hostage, and May 27, he was murdered in prison, dying in the attitude of blessing, and uttering words of forgiveness. He was the author of a number of works, among which are a life of Thomas à Becket, and a translation of the *Imitation of Christ*.

DARBY AND JOAN, hero and heroine of a ballad of the end of the eighteenth century, entitled *The Happy Old Couple*. They were celebrated for their long life and conjugal felicity. The originals of the ballad were said to have lived at Healaugh, a village in the West Riding of Yorkshire. According to Timperley, Darby was a printer in Bartholmew Close, who died in 1730, and he ascribes the ballad to Henry Woodfall, one of Darby's apprentices. The ballad has been attributed also to Prior, but its authorship is really uncertain.

DARBYITES. See PLYMOUTH BRETHREN.

DARCET, JEAN PIERRE JOSEPH, 1725–1801; a French chemist who wasted a fortune in the pursuit of his favorite science, sometimes suffering extreme privations. He was tutor to Montesquieu's sons, and assisted the father in his mental labors, particularly in preparing *The Spirit of the Laws*, and in his last moments defended him against the attacks of the Jesuits. In chemistry, Darcet made many valuable discoveries. In 1774, he was appointed professor of chemistry in the college of France, and in 1784, he became a member of the academy of sciences, and director of the porcelain manufactory at Sèvres. When the revolution began, he went with Robespierre and Danton.

DARDANELLES' (ancient *Hellespont*), a narrow channel separating Europe from Asia, and uniting the sea of Marmora with the Grecian archipelago. It extends from n.e. to s.w., between lat. 40° to 40° 30′ n., and long. 26° 10′ to 26° 40′ e., having a length of about 40 m., and a breadth varying from less than 1 to 4 miles. From the sea of Marmora, a strong current runs through the strait to the archipelago. To prevent an attack on Constantinople from the archipelago, the D. is strongly fortified on both sides, with many guns of immense caliber. A treaty concluded between the five great powers and Turkey in 1841, arranged that no ship of war belonging to any nation save Turkey should pass the D. without the express consent of Turkey; all merchant ships being also required to show their papers to the Ottoman authorities. These provisions were confirmed at London in 1871 and at Berlin in 1878, but in 1891 by an agreement with the Porte Russia secured for her "volunteer fleet" the right of passage through the D. The D. is celebrated in ancient history on account of Xerxes and Alexander having crossed it, the former in 480 B.C., to enter Europe; and the latter in 334 B.C., to enter Asia. The point at which Xerxes crossed, by two separate bridges, was in the neighborhood of Abydos, on the Asiatic shore, opposite to Sestos. Alexander crossed at nearly the same place; and here also young Leander nightly swam across to visit Hero — a feat performed in modern times by lord Byron for "glory."

DAR'DANUS, in Greek mythology, the ancestor of the Trojans. It is said that he crossed over from Samothrace to the Troad by swimming on an inflated skin, and founded the kingdom of Dardania before the existence of Troy. He is called a son of Zeus and the pleiad Electra; and the *Iliad* represents that Zeus loved him more than his other sons.

DARDEN, MILES, 1798–1857; b. N. C., and supposed to be one of the largest of men. He was 7½ ft. high, and at the time of his death weighed over 1000 lbs. His coffin was 8 ft. long, within an inch of 3 ft. deep, and 2 ft. 8 in. wide.

DARDENNE, a tp., St. Charles co., Mo.; 30 m. n.w. of St. Louis. Pop. '90, 4214.

DARE, a co. in n.e. North Carolina, on Albemarle sound, including a number of islands along the coast; 240 sq.m.; pop. '90, 3768, including colored. It is covered to a large extent with red cedar and cypress swamps. Co. seat, Manteo.

DARE, VIRGINIA, the first child b. in America of English parents, at Roanoke, Va. (now N. C.), Aug., 1587. She was the grand-daughter of John White, who was sent out by sir Walter Raleigh as governor of the colony, which had an unknown fate.

DAR'ES, a Trojan priest of Hephæstus (Vulcan) in the time of the Trojan war, to whom an account of the war has been attributed, though there is no doubt that the work was written at a much later period.

DARFUR', a country of Africa, e. of Sudan, is generally said to be situated in lat. 9° to 16° n., and in long. 22° to 29° e.; but its limits are not very clearly defined. D. towards the s. is hilly, the principal elevation being a mountainous ridge called Marrah, which traverses the country longitudinally, and is the source of numerous streams. Towards the n. D. is level, sandy, and almost destitute of water. During the rainy

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season, which commences in June, and continues till Sept., it exhibits a rich vegetation. The principal products are wheat, millet, rice, maize, and sesame. Tobacco, which is used by the natives in every form, abounds. Water-melons, also, are abundant during the rainy season. Among the fruits are tamarinds and dates. The minerals are chiefly copper and iron. The wealth of the inhabitants of D. consists chiefly in cattle. Horses, sheep, camels and game abound. D. carries on a considerable trade with Egypt, Mecca, and the inland countries of Africa; it was once a notorious center of the slave trade. The Furani are an intelligent well-built race, and have long been Mohammedans. Their numbers are variously estimated at from 1½ to 4 millions. D. was annexed to Egypt in 1874–5, but reasserted its independence after the Mahdi's revolt. In 1890–1 the greater part was acknowledged by Germany and Italy to be within the British sphere of influence. Capital, El Fasher. The residence of the governor is Fasher.

DAR'GAN, WILLIAM, railroad projector and capitalist, was b. Feb. 28, 1799, in county Carlow, Ireland, where his father was a large farmer. D. received, when young, a good education, and after spending some time in the office of a surveyor, where he acquired a high reputation for integrity and assiduous industry, he went to England, and was employed under Telford, who was then constructing the Holyhead road. Inspired perhaps by the example of that great engineer, D. now resolved to carve out a similar path for himself in his own country, and having returned to Ireland, obtained some small "jobs," the beginnings of a career crowned with the most splendid success—for he became one of the first capitalists in Ireland. It was D. who contracted for the first railway ever executed in Ireland (the Dublin and Kingstown), and he was afterwards connected with most of the great undertakings in that country, such as the making of railways, canals, tunnels, and embankments. He was also an extensive holder of railway stock, a steamboat proprietor, flax-grower, and farmer. He planned the industrial exhibition of Dublin (1853), with the view of developing more vigorously the material resources of his native country; and as a help towards its realization, placed £20,000 in the hands of a working-committee. This sum was gradually increased to about £100,000. The exhibition was opened on the 12th of May, 1853, by the lord-lieutenant; and was visited by the queen and prince Albert, when the honor of knighthood was offered to D., but was declined. In so far as the industrial exhibition was a *personal* speculation on the part of D., it was a failure, for he lost, it is said, £20,000 by it; but in every other respect it was highly gratifying to him, and to every genuine lover of his country. William D. was not one of those sham patriots with whom Ireland has been too often afflicted. He died Feb. 7, 1867.

DAR'IC, a gold coin of ancient Persia, used in Greece as well as Asia. It was much like the Greek stater. On the obverse is the figure of an archer kneeling, and on the reverse a royal palla. It was named from Darius Hytaspis. Its value for its times cannot now be definitely fixed; but in American gold it is not far from 7 dollars.

DARIEN, the name of a gulf on the northern coast of South America, and of the isthmus connecting the grand northern and southern divisions of the new world.—1. Gulf of D., the most southerly portion of the Caribbean sea, about 70 m. in length from n. to s., and 25 from e. to west. The shores are in most places steep, and are in many places fringed with shoals. The southernmost part of the gulf is called the bay of Choco, into which the considerable river Atrato debouches.—2. The isthmus of D. is a term commonly used as interchangeable with that of isthmus of Panama (q.v.), now the more usual name. D. was also the name given to a province in the republic of New Granada, corresponding to what is now the state of Panama in Colombia. One of the earliest Spanish settlements on the mainland was in D., the region being then called also by the Spaniards *Castilla de Oro* ("the Golden Castile") and forming the best known part of their *Tierra Firma*. In 1513, the conquistador Balboa, governor of the Darien settlement, crossed the isthmus with 290 men, and on 26th Sept. first caught sight of the Pacific ocean. As early as 1528, the idea of a ship canal across the isthmus was entertained; in 1826, a line for such a canal was traced between Panama and Portobello; and between 1843 and 1874, repeated surveys were undertaken by French, English, and American engineers with the same view. (See INTEROCEANIC SHIP CANAL, also see under PANAMA.) The principal ports on the northern shore of the isthmus are Chiriqui, Colon or Aspinwall on Limon bay, Portobello, San Blas, and Puerto Escoces on Caldeonia bay.

DA RIMINI, FRANCESCA, d. 1389, a woman of extraordinary beauty, daughter of a nobleman of Ravenna. She was married to Giovanni Malatesta, a dwarf; who detecting her in criminal relations with his brother Paolo, killed them both. Silvio Pellico found in this tale the subject of a tragedy; Dante refers to it in the *Inferno;* and Leigh Hunt wrote a poem, the *Story of Rimini*, 1819. The tragedy has been put into dramatic form by George H. Boker.

DARI'US, or DAREIUS, is the name of several Persian kings, and, like the Egyptian word Pharaoh, is *titular* and not *personal*.—DARIUS I., the son of Hystaspes, a Persian noble, leagued himself with six other nobles to murder Smerdis, the Magian, who had usurped the throne on the death of Cambyses. The conspirators were successful in their plot, and having, after some discussion, fixed on the monarchical as the proper form of government, D. contrived to be elected king, 521 B.C. His position at first was very insecure, but his caution, skill, and energy enabled him to govern his vast dominions for 36 years. To strengthen himself, he married the daughter of Otanes, who had

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been the head of the conspiracy, and likewise took three wives from the royal house—viz., two daughters of Cyrus, and one of Cyrus's son, Smerdis. He then divided his empire into 20 satrapies, and determined the exact amount of taxation to be borne by each. In some of the remoter provinces, great confusion seems to have prevailed after the death of Smerdis, the Magian; and a proof of how little D. could effect at first is afforded by the conduct of Orœtas, the governor of Sardis, who for some time was quite defiant of his authority. Babylon next revolted, and D. besieged the city unsuccessfully for two years. At last, however, it was taken by an extraordinary stratagem of his gen. Zopyrus, 516. In 513, D., with an army of 700,000, crossed the Bosporus by a bridge of boats, marched through what is now known as European Turkey to the mouths of the Danube, crossed, and advanced against the Scythians. The expedition proved a failure. D. retreated, but detached from his main force an army of 80,000 men under Megabyzus, to conquer Thrace, while he himself returned to Persia, where he extended his authority in the east as far as the Indus. The assistance given by the Athenians and Eretrians to the Ionic states, when they ventured to throw off the Persian yoke, and the part which they took in the burning of Sardis, determined D., who was also influenced thereto by the banished Hippias, to attempt the subjugation of the whole of Greece. In 495, he sent Mardonius with an army into Thrace and Macedonia, and at the same time dispatched a fleet against the islands. The former was routed by the Brygi in Thrace, the latter was shattered and dispersed by a storm when rounding the promontory of Mt. Athos. In 490, he renewed his attempt. His fleet committed great ravages in the Cyclades, but his army was entirely defeated at Marathon by the Athenians, under Miltiades, the "tyrant" of the Chersonese. In the midst of his preparations for a third expedition, D. died, 485 B.C.

DARIUS II., called, before his accession to the throne, *Ochos*, and after his succession, *Nothos* ("the Bastard"), was one of the seventeen bastard sons of Artaxerxes I. Longimanus. When Sogdianus, another of the bastards, had murdered the rightful king, Xerxes II., and assumed for himself the royal power, Ochos declared war against him, slew him, and secured the diadem for himself, 424–28 B.C. He now called himself *Darius*. His reign was ignoble. He showed himself to be completely under the control of his eunuchs and his cruel step-sister and spouse Parysatis. Rebellions were constantly breaking out among his satraps, all of which, however, were crushed except that of Amyrtæus, satrap of Egypt, who made himself independent in 414. It was during the life of D., and chiefly through the craft of Tissaphernes, satrap of Asia Minor, and of his successor Cyrus the younger, son of the king, that the Persians exercised so great an influence over the affairs of Greece in the last years of the Peloponnesian war. D. died 405–4 B.C.

DARIUS III., great grandson of D. II., called, before his accession, *Codomannus*, was a monarch noted for his mild disposition, handsome person, and courageous spirit. He was raised to the throne through the help of Bagoas, after the murder of Arses, 336 B.C. But in spite of his superior qualities, he could offer no solid opposition to the advance of the Macedonians. At the battle of the Issus, in 333, his mother, wife, and three children fell into the hands of Alexander; the victory of Gaugamela, in 331, opened to the latter the way to Susa and Persia proper. D. now fled to Ecbatana, in Media; and, on the approach of his opponent, to the northern provinces, where he was seized by Bessus, satrap of Bactria. Alexander, in a fit of generosity, hurried to deliver Darius. Bessus then prepared for flight, but D., refusing to follow, was stabbed by the barbarian, and left. The scouts of Alexander's cavalry found D. dying, and administered to his last necessities. Thanking the Grecian king for his magnanimity, and commending his family to his care, he expired (330). Alexander sent the dead body to Sisygambis, mother of D., to be interred in the tomb of the Persian kings. With him, the Persian empire, that had so long overshadowed Asia, came to a close.

DARJEEL'ING, a sanitary station of British India, in a district of the same name, in the Sikkim Himalayas. It is situated at an elevation of 7,400 ft. above the sea, on the side of a great hollow or basin, in which flows the Runjeet, a branch of the Teesta. It commands a magnificent view of the snowy ranges of the Himalayas to the n. and w. and is on the D. and Himalayan railway, a road remarkable for its elevation. Notwithstanding frequent heavy rains, and a very great annual rainfall, the climate is very salubrious. D. is only about 36 m. from the plain of Bengal, and 308 m. n. from Calcutta. It was obtained by the British government from the rajah of Sikkim in 1835, in order to be made a sanitary station. Pop. '91, 14,100.

DARK AGES, the period, not well defined, which elapsed between the fall of the Roman empire and the revival of letters in the 13th century. See MIDDLE AGES.

DARK DAY, in New England, May 19, 1780. The darkness commenced betwee 10 and 11 A.M., and continued until the middle of the next night. The wind was fro.. the s.w. and the darkness appeared to come with the clouds drifting from that point. It covered the country from New Jersey to Maine, and appears to have been greatest in Massachusetts and the adjoining portion of New Hampshire; yet it was intense in Connecticut and Rhode Island. It was much less in New York, and in New Jersey it was not particularly noticed. Where it most prevailed it was impossible to read ordinary print, or read the time by a watch or clock, or do ordinary business without artificial light. An intelligent observer says: "Candles were lighted in the houses; the

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birds, having sung their evening songs, disappeared and became silent; the fowls retired to roost; the cocks were crowing all around as at break of day; objects could not be distinguished but at a very little distance; and everything bore the appearance and gloom of night." Two other less conspicuous dark days had been noticed in the country, Oct. 21, 1716, and Oct. 19, 1762. A remarkable "Dark Day" occurred, 1881, Aug.

DARKE, a co. in w. Ohio, bordering on Indiana, intersected by a number of railroads; 600 sq.m.; pop. '90, 42,961. The surface is generally level and the soil fertile, producing cereals, hay, butter, wool, tobacco, etc. Co. seat, Greenville.

DARKE, WILLIAM, 1736-1801; b. Philadelphia; served through the revolutionary war, rising to colonel. He was killed in battle with the Miami Indians.

DARKHAN', MOUNT, a lofty granite mountain in Mongolia, in lat. 47° 36′ n., long. 110° 10′ east. It is interesting as the place whither annually repair large numbers of Mongolians to do honor to the memory of Genghis Khan (q.v.), to whom a monument has been erected here.

DARK HORSE is a term familiarly used in the vocabulary of American politics, of the second-rate or comparatively unknown man, brought forth in a nominating convention at the final moment as a candidate for office in the place of prominent rival candidates of his own party whose nominations would incur the risk of a divided vote, James K. Polk and Franklin Pierce were recognized *dark horses* of the Democratic party.

DARLASTON, a t. and parish in Staffordshire, England, 4 m. s.e. of Wolverhampton; population, '91, 14,422. It has extensive mines of iron and coal and manufactures of hardware.

DARLEY, FELIX, OCTAVIUS CARR, b. Philadelphia, 1822; an artist whose drawings for engravers have given him lasting fame. His illustrations appear in the works of Irving, Cooper, Longfellow, and others. Among some of the best known are illustrations of the *Legend of Sleepy Hollow*, and *Rip Van Winkle*. In 1868, he published, after a visit to Europe, *Sketches Abroad with Pen and Pencil*. He made many designs for government banknotes, etc. His water-color paintings of incidents in American history are very spirited. He d. 1888.

DAR'LING, a name derived from a governor of New South Wales, and applied to a district, a mountain-range, and a river in Australia.—1. The Darling Downs district includes an extensive tract near the dividing range in the s. of Queensland. The district, which comprises several counties, lies between the Condamine and Darling rivers. It is the richest pastoral district in the colony, and comprises a vast extent of fine agricultural land.—2. A mountain range, running n. and s., about 250 m. long, lying wholly in West Australia. It terminates in the direction of the sea at Point d'Entrecasteaux. Its culminating summit is not less than 3,000 ft. above the sea-level. —3. The river Darling, in New South Wales, aptly characterized as "mysterious," demands special attention, not only in itself, but also in connection with some of the most striking peculiarities of the country. From the western declivities of the almost continuous ridge that skirts the eastern coast, innumerable torrents pour down into the vast plains, which gradually slope away towards the interior. The more northerly of these torrents converge in a central "basin of clay," on the 30th parallel of s. lat., where, within a comparatively narrow space, meet the Maranoa, the Condamine, the Dumaresque, the Gwydir, the Namoi, the Castlereagh, the Macquarie, and the Bogan. In this region, the channels undergo many transformations, sometimes losing themselves in wide marshes, and sometimes presenting an inextricable labyrinth of bifurcations and junctions. After parting with a large proportion of their volume, under the combined influences of evaporation and absorption, the united streams, now distinguished as the D., pursue a journey of 600 m. to the Murray, through plains which are habitable only on the immediate verge of the water-course. Through this immense reach, the D. receives not a single affluent; nay, on the contrary, it sends out many an offset, to bury itself in some stagnant lagoon. It may be added, that none of the so-called rivers of this region of Australia, with the solitary exception of the Murray itself, is really entitled to the name. Between lofty banks of bare earth, they exhibit at times an inundating flood, at times a mere series of detached pools of every size and shape.

DAR'LING, GRACE, a name famous in the annals of heroism, was the daughter of William Darling, lighthouse-keeper on Longstone, one of the Farne islands, and was born at Bamborough, 24th Nov., 1815. On the morning of the 7th Sept., 1838, the *Forfarshire*, which, with 63 persons on board, had been wrecked among the Farne Islands, was seen by Darling from his lighthouse, lying broken on the rocks. At the solicitation of his daughter, then in her 22d year, he put off through the storm to the wreck; his only companion the noble girl who prompted the generous act. By wonderful strength and skill, they brought their boat to where the sufferers (nine in number) crouched, in momentary expectation of a watery grave, rescued them, and bore them safely to Longstone. Such an undertaking, so daring in itself, and so successfully carried out, filled every one with the warmest admiration. The lighthouse at Longstone, no longer solitary and peaceful, was visited by many of the wealthy and the great. Presents, testimonials, and money were heaped at the feet of the heroine; but she did not long survive her change of circumstances. She died of consumption, after a year's illness, on Oct. 20, 1842. See *Grace Darling*, by E. Hope (1876).

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DAR'LINGTON, a co. in n.e. South Carolina, on the Great Pedee river, intersected by several railroads; 673 sq. m.; pop. '90, 29,134, includ. colored. It is well watered and fertile, producing cotton, rice, corn, etc. Co. seat, Darlington.

DAR'LINGTON, or DARN'TON, a burgh in Durham co., England, in a rich tract, on a hill-slope, on the banks of the Skerne, near its junction with the Tees, 18 m. s. of Durham city. It consists of a square market-place, from which branch several streets called gates. Pop. in '91, 38,060, many belonging to the society of Friends. The chief manufactures are woolen yarns, for imitation Indian shawls, Brussels carpets, etc.; flax, optical glasses, brass, and iron wares. Near D. was the seat of George Allan, the antiquary. St. Cuthberts, the beautiful parish church, was built in the 12th c. and has three carved stone stalls, and a tower 180 ft. high. At Oxen-le-field, 3 m. from D., are curious cavities of unknown origin, called Hell Kettles.

DARLINGTON, WILLIAM, LL.D., 1782–1863; b. Penn.; a botanist. In 1806 he went to Calcutta, and on returning published an account of his voyage. In the war with England he served with distinction. In 1815 he was chosen to congress and re-elected in 1819. At Westchester, Pa., he founded an athenæum, an academy, and a society of natural history. Among his publications are *Mutual Influence of Habits and Disease; Agricultural Chemistry; Agricultural Botany;* and *Memorial of John Bartram.*

DARLINGTO'NIA, a perennial plant of California of the order sarraceniaceæ. Its leaves are very large, sometimes 2 ft. long, and are hollow and twisted, the upper part being shaped like a hood, under which is the opening into the pitcher of the leaf. The flower stalk is frequently 4 ft. high, the flower single, and about 2 in. across.

DARM'STADT, a t. of Germany, capital of the grand-duchy of Hesse-Darmstadt, residence of the grand duke, and seat of government, is situated on the river Darm, 15 m. s. of Frankfort-on-the-Main. It consists of an old and new town, both of which are surrounded by walls and ditches. The streets of the former are narrow and squalid, but those of the latter exhibit many imposing specimens of architecture. D. has five public squares, from the center of one of which a fine Doric column rises to the height of 134 ft., and is surmounted by a statue of the grand duke Louis, who founded the new town. Besides the arsenal, the barracks, and the various religious edifices, one of which is crowned by a dome supported upon 28 large columns, D. has two palaces; one of these, the old ducal palace, contains the museums of painting—including pictures by the most famous of the old masters—and natural history, in which are shown fossil remains of the deinotherium. The palace contains also a large and very valuable public library. D. is more dependent upon its ducal court and the government, which holds its seat there, than upon its commerce or manufactures, but these are now becoming more important. Pop. with suburb, '95, 63,739.

DARMESTETER, ARSÈNE (1846–88) and JAMES (1849——), French linguistic scholars. ARSÈNE D. wrote a number of important philological works, including *Formation des Mots Composés* (1874); *On the Creation of New Words* (1877), and *The Life of Words* (1887); and also began with Hatzfeld a general dictionary of the French language. JAMES D. is distinguished for his Oriental studies, especially in the field of Persian literature. He also wrote *Lettres sur l'Inde, et la Frontière Afghane* (1888); *La Légende Divine* (1890), *Chants Populaires des Afghans* (1890); *Les Prophètes d'Israël* (1892), etc. His wife A. MARY F. ROBINSON D., b. 1857, is the author of poems; translations from the Greek; *Arden*, a novel; and several historical sketches.

DAR'NEL, *Lolium temulentum*, a grass of the same genus with the valuable ryegrass (q.v.), an annual, common in cornfields in England and many parts of Europe. It has no tufts of leaves from the root, the glumes are as long as the spikelets, or longer, the spikelets contain 5 to 7 florets, which are awned. This grass has from ancient times been reputed to have a narcotic poisonous seed, to which many bad effects were ascribed, which, in years of bad harvest, were observed to ensue upon the eating of bread or the feeding of horses upon oats. Even Lindley, in his *Medical and Œconomical Botany*, published in 1849, ascribes narcotic and acrid qualities to D. seed, and speaks of fatal consequences as produced by it when mixed with flour, saying that it "is the only authentic instance of unwholesome qualities in the order of the grasses." On the other hand, it is asserted that very recent researches on the continent have completely established the perfect harmlessness of this grass and of its seed; and the effects which have been ascribed to it must therefore be regarded as proceeding from grain injuriously affected in some way by bad weather. See illus., GRAIN, ETC., vol. VI.

DARN'LEY, HENRY STEWART, Lord, husband of Mary queen of Scots, the eldest son of the earl of Lennox by Lady Margaret Douglas, was b. in 1546, in England, where also he was educated. He was handsome in appearance, accomplished in manners, but fatally destitute of all moral and intellectual power. D. was killed by the Earl of Bothwell, Feb. 9, 1567. See MARY STEWART.

DARTER, *Plotus*, a genus of birds very nearly allied to cormorants (q.v.), but having a bill longer than the head, perfectly straight, slender, and sharp-pointed; and also remarkable for the great length of the neck, which has obtained for them the name of *snake-birds*. They derive the name D. from darting forward their bill at their prey by means of their long flexible neck. They are very voracious, and eat great quantities of fish, which they swallow entire. They are found in warm climates.

DART'FORD (Saxon, *Darentford*), a t. in the n.w. of Kent, 14 m. e.s.e. of London Bridge, on the left bank of the Darent, which is navigable for barges. It lies in a narrow

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valley between two steep hills. Pop. '91, 11,962. It has large corn-mills, cotton and silk printing-works, large powder and paper-mills; also manufactures of oil, iron, machinery and chemicals. Near D. stood the first rolling, slitting, and wire-drawing mill in England, as well as the first paper-mill, built by Spielman, who died in 1607. Here stand the ruins of a nunnery, founded 1355, by Edward III., with 12 acres of walled orchards and gardens. This king held a tournament here in 1331. Wat Tyler's insurrection, in the reign of Richard II., broke out at D. in 1381. Watling Street, an ancient Roman road, crossed the river here. Near D. heath are many ancient chalk hollows and pits, with deep shafts leading to numerous chambers and galleries, excavated probably for sepulture, for retreat, or to make use of the chalk.

DARTMOOR, a granitic table-land in the south-western part of Devonshire, England, remarkable for its wild and rugged scenery, its towering rock-capped hills, the numerous streams that have their source in its boggy soil, and the many cyclopean relics of the aboriginal inhabitants that are scattered over its solitary wastes, where the deep silence is broken only by the sudden flight of the ring-ouzel, the screams of the curlew, or the shrill whistle of the lapwing, dotterel, or stone-plover. D. proper (or the ancient and royal forest of that name) and its adjuncts, including the outlying common lands that present the same physical features, extend about 20 m. from e. to w., and 22 m. from n. to s., occupying one fifth of the entire area of the county of Devon, or more than 130,000 acres. This moorland region, encircled by a natural rampart, moated by deep valleys, has a very considerable elevation above the surrounding country, and culminates in Yes Tor, 2,050 ft. above the sea-level. Its broken uneven surface has been compared, not inaptly, to "the long rolling waves of a tempestuous ocean, fixed into solidity by some instantaneous and powerful impulse."

The most important *rivers* that rise in northern D. are the Dart, the Teign, the Taw, the West Ockment or Okement, the Lyd, the Tavy, and the Walkham; while from the swamps of southern D. spring the Plym, the Yealm, the Erme or Aime, and the Avon, Aven, or Aune.

Geologically, D. is formed, for the most part, of granite rock, which has been protruded through the shales, slates, and sandstones of the Devonian system. Large masses of trap occur at White Tor, Cock's Tor, and other localities. Tin, copper, and manganese are found amongst the granite, of which four varieties—common, finer, red, and compact—are distinguished. These, as well as the several kinds of trap-rock, are much used for economical purposes. At Wheal, Duchy, and Birch Tor are productive tin mines. The *soil* of D. is composed chiefly of peat, which in the bottoms has accumulated in some places to the depth of 25 ft.; it rests on a subsoil of fine sand. Many of the well-watered dells and ravines are fertile, while the whole moor affords pasturage for cattle, sheep, and horses. Amongst the mosses and lichens, with which the region abounds, are the *lecanora perella* and the *L. tartarea*, or cudbear lichen. See CUDBEAR. Some years ago, both these lichens were largely exported; and it is said that, from 1762 to 1767 inclusive, nearly 100 tons of the *L. tartarea* were collected from the tors of the moor. Wistman's wood, a grove of stunted oak-trees, averaging about ten feet in height, is of venerable antiquity. It stands on a rocky declivity about 400 yards in length, and measures less than 100 yards across the widest part. The *ornithology* of D. is more limited than formerly; the progress of cultivation and the preservation of game are driving away the eagle, the bustard, the crane, and the kite, which are now rarely seen. The blackcock is likewise becoming extinct. Dr. Moore says: "The frequenters of the uncultivated parts are now chiefly the sparrow-hawk, the hobby, the goshawk, the hen-harrier, the brown or marsh harrier, and the buzzard." The *antiquities* of D., as illustrating ancient periods of British history, are worth an attentive study; of these, the Gray Wethers, below Sittaford Tor—a fine specimen of what is usually styled a Druidical circular temple—the vestiges of a large aboriginal village at Grimspound, the cromlech at Drewsteignton, the logan-stones and stone-avenues, the kistvaens, barrows, cairns, rock-pillars, and ancient trackways, whose story the old tors alone could tell, are examples. Many legends and stories of moorland adventure are related; but the most famous is that of the bold hunter, Childe of Plymstock, whose fate Carrington has celebrated in a spirited ballad. See Carrington's Poems, Mrs. Bray's *Tamar and Tavy*, and article "Lost on Dartmoor," *Chambers's Journal*, vol. i. p. 350.

During the long war with France, consequent on the great revolution and the career of Napoleon, a prison was erected in the center of the western quarter of D., at about 1400 ft. above the sea-level, for the accommodation of prisoners of war. The first stone was laid on the 20th Mar., 1806, and the building was finished at a cost of £127,000. Prince Town sprang up close by, and soon became a thriving place. During the war with the United States (1812–15), many American prisoners were confined at Dartmoor.

The castle, manor, and forest of D. were granted by Henry III. to his brother Richard, earl of Cornwall; and since 1337 A.D., D. has been permanently annexed to the duchy of Cornwall.

See De la Beche's *Report on the Geology of Cornwall, Devon, and West Somerset* (Lond. 1839); and for a full account of D., *A Perambulation of the Ancient and Royal Forest of Dartmoor*, etc., by Rev. S. Rowe (Plymouth and Lond. 1856); also *Papers on*

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the Geology, Soil, Botany, and Ornithology of Dartmoor, by Ed. Moore, M.D., etc., in appendix of the above work.

DARTMOUTH, a town of Halifax co., Nova Scotia, is situated on a small river emptying into Halifax or Chebucto bay, and opposite the city of Halifax, of which it is practically a suburb. It contains many handsome residences, the provincial asylum for lunatics, several foundries and tanneries, and is connected by ferry with Halifax. Pop. 1891, 6252.

DARTMOUTH, a parliamentary and municipal burgh and seaport, in the s. of Devonshire, built in terraces on a steep slope 300 to 400 ft. high, on the right bank of the romantic estuary of the river Dart, at a short distance from the sea. D. is 32 m. s. by w. of Exeter. The streets are narrow, and many of the houses very old, with overhanging stories, projecting gables, and wood-carvings. St. Saviour's church, of the 14th c., has a richly sculptured, painted, and gilt stone pulpit, a highly ornamented interior, and a beautifully carved rood-loft. A battery, and the remains of a castle built during the reign of Henry VII., stand at the entrance to the harbor, which affords secure anchorage for vessels. Pop. '91, 6038. It once traded very extensively in fish from the Newfoundland coast, and Sir Humphrey Gilbert, the Newfoundland explorer, was born near the town. At D., in 1190, the crusaders, under Richard Cœur-de-Lion, embarked for the Holy Land. The French burned the town in the time of Richard I., but were repulsed in a third attack on it in 1404.

DARTMOUTH COLLEGE, at Hanover, N. H., had its origin in Moor's charity school, an institution for the education of Indian children, organized at Lebanon, Conn., in 1754, by Eleazar Wheelock, D.D. The school was maintained by funds derived from various sources,—first, from private individuals; second, from the General Courts of Massachusetts Bay and New Hampshire, and third, from Great Britain, where the Indian preacher Samson Occom aroused much interest in the enterprise. It was largely through his efforts that the endowment, consisting of a sum of ten thousand pounds, was raised. This sum was entrusted to the charge of a board of trustees with the Earl of Dartmouth at its head. The sympathy felt in Great Britain for the new institution led Dr. Wheelock to extend the scope of its project and to arrange the courses of the school in such a way as to reach a greater proportion of English youth. Dartmouth College received its charter in 1769 from George III., at the hands of John Wentworth, royal governor of New Hampshire. Dr. Wheelock became the first president, and the name given it was in honor of lord Dartmouth. Hanover, on the Connecticut river, on the western border of New Hampshire, was selected as a suitable location for the College, and grants of about 44,000 acres of land were made. An independent charter was obtained soon afterwards for Moor's school, which was continued as a separate department until 1849. When Dr. Wheelock removed his school in 1770 from Lebanon to Hanover, the students consisted of 18 whites and 6 Indians, and the first class of four students graduated in 1771. Dr. Wheelock died in 1779, and was succeeded by his son, John Wheelock, who after a presidency extending over 36 years, was removed from his office by the trustees in 1815. A religious controversy had caused a disagreement which led to a conflict with the legislature of the state. The legislature favored Dr. Wheelock, and passed an act to amend the charter, to change the title to "Dartmouth University," and to increase the number of trustees from twelve to twenty-one, a majority of whom should constitute a quorum. A second act, passed Dec. 18, 1816, gave the governor and council power to fill all vacancies that might happen in the board of trustees previous to the next meeting. The cause of the College was argued in the state court by Daniel Webster, Jeremiah Smith, and Jeremiah Mason, who were opposed, in behalf of the state, by Ichabod Bartlett and George Sullivan. At the Nov. term of the court, 1817, chief justice William M. Richardson rendered a decision which was adverse to the College. The case was at once carried to the supreme court of the United States, and was argued at Washington in that powerful speech which first gave Mr. Webster his national fame. Opposed to him were John Holmes, of Maine, and the attorney-general, William Wirt. In Feb., 1819, Chief-justice Marshall gave a decision in favor of the College. "The university" organization was dissolved, and the old college board of trustees sustained. The question in this conflict was of vital importance, not only to Dartmouth College, but to many other institutions, and the decision secured the sacredness of private trusts. Dr. Wheelock, who had been elected president by the new board of the University in Feb., 1817, died within two months, and was succeeded by William Allen, D.D., who held the office until the decision of Chief-justice Marshall in 1819. Francis Brown, D.D., who had been elected president of the College by the old board in 1815, held the office until his death in 1820. His successors were: Daniel Dana, D.D., 1821; Bennet Tyler, D.D., 1821–28; Nathan Lord, D.D., 1828–63; Asa Dodge Smith, D.D., LL.D., 1863–76; Samuel C. Bartlett, D.D., LL.D., 1877–92; and William Jewett Tucker, D.D., LL.D., 1893– .

The college comprises three departments, the academical, medical, and engineering, so associated that each shares in some measure the advantages of the others. The older buildings of the college are: Dartmouth Hall, built 1786, of wood, 150 by 50 ft., and three stories high, containing various recitation rooms, and rooms for students; Wentworth and Thornton Halls, dormitories, built in 1830, of brick, 70 by 50 ft.; Reed Hall, built of brick in 1840, 100 by 50 ft., containing the rooms of the physical department; Bissell Hall, the gymnasium, built in 1867, of brick, 90 by 47 ft.; Moor Hall, entirely rebuilt in 1870, 56 by 36 ft.; Culver Hall, built in 1870, a

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handsome structure, 100 by 60 ft., four stories high, containing laboratories, lecture-rooms, and rooms for the various cabinets and museums; the medical building, 72 by 32 ft., built in 1812; the Observatory, 60 by 18 ft., in 1853, and Conant Hall, erected in 1874. Except Conant and Bissell Halls, the buildings of the College are situated in the college park, a tract of about 40 acres, in the eastern part of the village: the chief eminence commands a view of great beauty, and the grounds are shaded with large and beautiful elms. The academic year begins about the middle of Sept., and commencement is on the last Wednesday of June; the year is divided into three terms of 37 weeks in all. The regular course occupies four years; its required, elective, "Latin-scientific" and "Chandler Scientific" groups entitle the student, upon the completion of the course, to the degree of bachelor of arts, bachelor of letters or bachelor of science. The degrees of master of arts and master of science are conferred after authorized courses of study, resident and non-resident.

The Chandler Scientific Department was established in 1851, by a resolution of the trustees, in acceptance of a sum bequeathed to them in trust by Abiel Chandler, esq., late of Walpole and formerly of Boston, Mass., "for the establishment and support of a permanent department or school of instruction in the College, in the practical and useful arts of life, comprised chiefly in the branches of mechanics and civil engineering, the invention and manufacture of machinery, carpentry, masonry, architecture and drawing, the investigation of the properties and uses of the materials employed in the arts, the modern languages, and English literature, together with book-keeping and such other branches of knowledge as may best qualify young persons for the duties and employments of active life." In 1893 the "Chandler School" became the "Chandler Scientific" course in the college.

At the session of the legislature of New Hampshire in 1866, an act was passed establishing the "New Hampshire College of Agriculture and the Mechanic Arts," on the basis of the congressional land grant, and authorizing its location at Hanover and its connection with Dartmouth College.

The Medical Department was founded in 1797; there are two terms of 44 weeks in all, beginning in July and in Jan.; students 21 years of age, who have devoted three years to the study of medicine, and during that time have attended two courses of medical lectures, including one at Dartmouth, receive the degree of doctor of medicine. A museum of pathological anatomy has been recently added to this department.

The Thayer School of Civil Engineering aims to provide an exclusively professional training for young men who may desire instruction of an advanced character. The course is essentially "post-graduate," limited in range, and fundamental in its scope.

The general faculty comprises, besides the president, 40 professors, 12 other instructors, and a librarian. In 1896-97 the number of students was 620, including 468 in the academical, 145 in the medical, and 11 in the civil engineering department. The number of alumni associations formed in the U. S. is 18. The number of volumes in the several libraries is as follows:

General library	85,000
Thayer school library	2,500
Astronomical library	1,500
Total	89,000

A new library-building, Wilson Hall, fireproof, and of handsome design, has been lately erected for the reception of the consolidated libraries. Other recently erected structures are the Hitchcock Hospital; a new building, Bartlett Hall, for the use of the Young Men's Christian Association, Rollins Chapel, Sanborn House and Crosley House, dormitories with modern conveniences, and Butterfield museum. The Agricultural College was removed to the town of Durham in 1893 in order to secure a valuable endowment, to which the condition of removal was attached.

The Alumni Association of the College has now five representatives in the Board of Trustees.

DA'RU, Pierre Antoine Noël Bruno, Comte, 1767–1829, b. Montpellier; author, and one of the ablest of the first Napoleon's ministers. In his sixteenth year he entered the army. In 1791, he was appointed intendant of the army of Brittany; but was unjustly suspected of being a royalist and imprisoned till the fall of Robespierre. He spent his time in translating the odes and epistles of Horace (*Traduction en Vers des Poésies d'Horace*, 1800). Subsequently, he translated the satires. In the same year in which his version of Horace appeared (1800), he published *Cléopedie ou la Théorie des Réputations en Littérature*, a work full of spirit and felicitous turns of thought. Napoleon, in 1805, made him a councilor of state, and at a later period intrusted him with the portfolio of the war department. After the restoration of the Bourbons, he was made a peer. Thenceforth, he devoted himself exclusively to letters. D. was a member of the institute and of the academy of sciences. His writings are numerous. Besides those already mentioned, the chief are *Histoire de la République de Venise* (7 vols. 1819 to 1821); *Histoire de Bretagne* (3 vols. 1826); *Eloges;* his examination of the *Génie du Christianisme; Discours sur les Facultés de l'Homme* (in verse); *Discours sur la Liberté de la Presse*.—His son, Napoleon Count Daru, named after

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the emperor, was born in 1807, and had the fortune (strangely enough) to be as much disliked by Napoleon III. as his father was liked by Napoleon I. Some time after the *coup d'état*, which he had opposed, he was placed on the list of the proscribed; but became minister of foreign affairs, 1870, and a senator, 1876. He d. in 1890.

D'ARUSMONT, FRANCES (maiden name, **FANNY WRIGHT**), 1795–1852; a native of Dundee, Scotland. From her friend Adam Smith and other learned men, she imbibed advanced ideas of social reform, and when still young published a defense of the doctrines of Epicurus. From 1818 to 1821, she resided in the United States, and, after a visit to France, returned in 1825 and secured land on the Mississippi (near the present Memphis, Tenn.), to make an experiment of the elevation of colored people. It was a failure, and after several years of useless expense her people were set free and sent to Liberia. In later years she lectured in various places, advancing views which led to much persecution. In 1838, in France, she married M. d'Arusmont, but the union was not happy. She afterwards returned to the United States and settled in Cincinnati, where she died. Her chief publications are *Views on Society and Manners in America; Altorf*, a tragedy; and *Lectures on Free Inquiry*.

DARWIN, CHARLES ROBERT, F. R. S., an English naturalist of the highest eminence, was b. at Shrewsbury, Feb. 12, 1809; son of Dr. Robert W. Darwin, F. R. S., and grandson of Erasmus Darwin (q.v.). His mother was a daughter of Josiah Wedgwood, the famous manufacturer of pottery. After attending a public school at Shrewsbury for some years, he studied at Edinburgh university for two sessions, and thence proceeded to Christ college, Cambridge, where he took his degree of B.A. in 1831. He now volunteered to go as naturalist in H.M.S. *Beagle*, commanded by Capt. Fitzroy, R.N., and started for a survey of South America, and the circumnavigation of the globe, Dec. 27, 1831, returning to England, Oct. 2, 1836. His entire life, so far as his health permitted, was closely devoted to scientific researches. Darwin was a fellow of the principal scientific societies, and obtained the royal society's medal, and the Wollaston medal of the geological society.—His earliest well-known work, *The Voyage of a Naturalist* (2d ed. 1845), is a most interesting and beautifully written work. In 1839, was published his *Journal of Researches into the Geology and Natural History of the Various Countries visited by H.M.S. Beagle;* in 1840–43, the *Zoology of the Voyage of H.M.S. Beagle*, published by government, to which D. contributed the introduction, and many of the notes; in 1842, *The Structure and Distribution of Coral Reefs;* in 1844, *Geological Observations on Volcanic Islands;* and in 1846, his *Geological Observations on South America*. Darwin also wrote many papers in the *Transactions of the Geological Society*. In 1851–53, appeared his valuable *Monograph of the Cirripedia;* and in 1859, D.'s name became "familiar as a household word" to the mass of educated and semi-educated Englishmen, through the publication of his work, *The Origin of Species by Means of Natural Selection, or the Preservation of Favored Races in the Struggle of Life*. In the *Origin of Species*, D. contends that the various species of plants and animals, instead of being each specially created and immutable, are continually suffering change through a process of adaptation, by which those varieties of a species that are in any way better fitted for the conditions of their life survive and multiply at the expense of others. So potent and universal does this process of natural selection seem to be, that D. considers it capable, with other less important causes, of explaining how all existing species may have descended from one or a very few low forms of life. This theory has excited controversies which are not yet laid to rest; but it has been embraced by many of the ablest naturalists, and has already induced great changes in the methods of biology and kindred sciences. See SPECIES. D. subsequently wrote *Fertilisation of Orchids* (1862); *Variation of Plants and Animals under Domestication* (1867); *The Descent of Man and Selection in Relation to Sex* (1871); *Expression of the Emotions in Man and Animals* (1873); *Insectivorous Plants* (1875); *Climbing Plants* (1875); *The Effects of Cross and Self-fertilisation in the Vegetable Kingdom* (1876); and *Different Forms of Flowers in Plants of the same Species* (1877); also on *Movement in Plants*, and on the formation of mold by earth worms. Latterly D. received many high distinctions, such as the Prussian order *Pour le Mérite* (1871), degrees from Leyden (1875), and Cambridge (1877), and the membership of the French academy (1878). He d. April 19, 1882. See *Life and Letters*, by his son (1887).

DARWIN, ERASMUS, M.D., an English physician, natural philosopher, and didactic poet, was b. 12th Dec., 1731, at Elton, near Newark, in Nottinghamshire; studied first at Cambridge, and afterwards at Edinburgh, where he took his degree; and finally settled in Derby, where he died 18th April, 1802. D. had once a great reputation as a physiologist, but his system is, for the most part, inconsequential, baseless, and untenable. At the same time, many of his ideas are original, suggestive, and contain within them the germs of important truths. His strength and his weakness lay in his faculty for seeing analogies in nature. Sometimes he is exceedingly happy in his discoveries, at other times he is quite fantastical. The same remarks hold good as regards his verse, where, amid the frequent extravagance and incomprehensibility of his notions, there burst forth strains of genuine poetry. D.'s chief works are his *Botanic Garden*, in verse

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(Lond. 1781); his *Zoonomia, or the Laws of Organic Life* (1793); and his *Phytologia, or Philosophy of Agriculture and Gardening* (1800).

DARWINISM, a term often too widely applied, and made to cover every subject relating to the origin and development of species. Of the writers, mainly in England, who have gathered the vast array of facts taken as a basis for the doctrine of evolution (see SPECIES), Charles Darwin (see DARWIN, CHARLES), here deserves especial notice. Though modestly confining himself to the problem of accounting for the evolution of the higher organic forms out of the lower, Darwin has done much to further the idea of a gradual evolution of the physical world. The philosophic significance of the hypothesis of natural selection, especially associated with Mr. Darwin, is due, as prof. Helmholtz points out, to the fact that it introduces a strictly mechanical conception in order to account for those intricate arrangements known as organic adaptation, which had before been conceived only in a teleological manner. By viewing adaptations as conditions of self-preservation, Darwin explains the abundant appearance of purpose in organic nature. By his resolute endeavor in this direction, he has done much to eliminate the teleological method from biology, while it is true, that, in his conception of seemingly spontaneous variations and of correlations of growth, he leaves room for the old manner of viewing the organic development as controlled by some internal organizing principle. Again, Darwin has greatly extended the scope of mechanical interpretation by making intelligible, apart from the co-operation of intelligent purpose, a genesis of the organic world as a harmonious system of distinct groups, a unity in variety, having certain well-marked typical affinities. Darwin in his doctrine of the organic world as a survival refers this appearance of systematic plan to perfectly natural causes, thus giving new meaning to the ancient theory that the harmony of the world arises out of discord. Once more, his hypothesis is of wide philosophic interest, since it supports the idea of a perfect gradation in the progress of things. The variations which he postulates are slight, if not infinitesimal, and effect a sensible functional or morphological change only after they have been frequently repeated and accumulated by heredity. Darwin's later work, in which he applies his theory of the origin of species to man, is a valuable contribution to a naturalistic conception of human development. The mind of man in its lowest stages of development is here brought into close juxtaposition to the animal mind, and the upward progress of man is viewed as effected by natural causes, chief among which is the action of natural selection. He does not inquire into the exact way in which the mental and bodily are connected. He simply assumes that, just as the bodily organism is capable of varying in an indefinite number of ways, so may the mental faculties vary indefinitely in correspondence with certain physical changes. In this way he seeks to account for all the higher mental powers, as the use of language and reason, the sentiment of beauty, and conscience. Finally, Darwin seeks to give a practical and ethical turn to his doctrine, since he defines the general good—the proper object of man's action—as "the rearing of the greatest number of individuals in full health and vigor, and with all their faculties perfect under the conditions to which they are subject." In his view of the future of the race, he leans to the idea that the natural process which has effected man's first progress must continue to be an important factor in evolution, and that, consequently, it is not well to check the scope of this process by either an undue restraint of population, or a charitable preservation of the incompetent. It is well to observe that if Darwinism confined itself to a strict following of the great investigator, it might involve less of philosophic and metaphysical theory than has become popularly associated with it, for much of which Darwin is not to be held responsible, at least in the terms of his presentation. Facts and the co-ordination of facts in their physical ranges are his inestimable contribution to science. Beyond the physical relation, he does not mark out a path. It is evident that from his treasury of facts, widely divergent systems of evolution may be drawn, according as the evolution which he has presented as a fact is accounted for by referring its cause or its working force to one or another set of principles.

DARWIN MOUNT AND SOUND are on the s.w. side of King Charles's South Land, Terra del Fuego. The mountain is nearly 7,000 ft. in height.

DASH'KOV, Princess EKATERINA ROMANOVNA, daughter of count Vorontsov, was b. 1743, and from her earliest youth received a careful training, especially in classics. She was an intimate friend of the empress Catharine II., and one of the heads of the conspiracy formed against Peter III., the success of which secured the throne to Catharine. Her conduct in this dangerous affair was, in truth, quite Amazonian; she rode forth in uniform at the head of a part of the troops whom she had instigated against Peter; but soon afterwards quarreled with Catharine, because the latter would not gratify her desire to be made col. of the imperial grenadiers. She now removed from the court, obtained permission to travel, and visited Germany, England, France, and Italy, where she made the acquaintance of many learned men (among others, Garrick, Dr. Blair, and Dr. Robertson, with the last of whom she wished to place her son for the purpose of being educated), and in 1782, returned to St. Petersburg. The empress and she were reconciled to each other, and the princess was appointed director of the St. Petersburg academy of arts and sciences; and in 1783, president of the Russian academy, established at her own suggestion in imitation of the French *Académie*. On the death of

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Catherine in 1796, she was deprived of her offices, and ordered by Paul III. to retire to her estates at Novgorod. She died at Moscow, 16th Jan., 1810. Besides writing several comedies and occasional magazine-papers, the princess D. was mainly instrumental in inducing the Russian academy to draw up a dictionary of the Russian language. This work was completed in twelve years. The princess herself assigned the various letters of the alphabet to different scholars, took three herself, and superintended the execution of the whole. Her very interesting memoirs were published by Mrs. W. Bradford (2 vols., Lond. 1840).

DASS, PETTER, 1647–1708; son of a Scottish merchant of Dundee, who, in 1630, left his native land to escape from the troubles in the Presbyterian church, settled in Bergen, Norway, and married a Norse girl. Thus, though of Scottish descent, Dass was born on an island on the coast of Norway, and was educated in Bergen university. In 1672, he was ordained a priest, and for many years fulfilled the duties of that office in the wild northern regions of that country, during which period he wrote innumerable reams of verses. These writings passed from hand to hand, but few of the poems were printed in his life-time. The most famous, *The Trumpet of Northland*, was not published until 1739. *The Norwegian Song of the Valley* appeared in 1696, and in 1711, came a volume entitled *Spiritual Pastime*. Even now the *Trumpet* is one of the most favorite national poems, and long ago won for its author the title of "father of Norwegian poetry." It is a rhymed description of the province of Northland, given in dancing verse of the most breathless kind, and full of humor, fancy, wit, and quaint learning.

DA'SYA, a genus of red algæ, about a dozen species of which are found in the United States. The genus includes some of the most beautiful sea-weeds.

DASYURE, *Dasyu'rus*, a genus of carnivorous marsupial quadrupeds, nearly allied to the opossums; but differing from them in having only eight incisors in the upper, and six in the lower jaw, and only twelve molars in each jaw; also in their tail being everywhere covered with long hairs, and not prehensile; in the hinder thumb being reduced to a mere tubercle, or wanting; and in the important anatomical character of the want of a cœcum. All the species are Australian. The URSINE D., or ursine opossum (*D. ursinus*), was very abundant in the n. of Van Dieman's Land, when first colonized, and very destructive to sheep and poultry. It is about the size of a badger, of a stout form, with a tail half as long as the body; the body and tail covered with coarse black hair, marked with white bands. It burrows in the ground. It is very untamable. The spotted-tailed D. (*D. macrourus*) is about as large as a cat, has a tail fully as long as the body, is of a rich brown color with white spots, and, as well as a rather smaller species (*D. Maugii*), the *wild cat* of the colonists, is very destructive to poultry in Van Dieman's Land. See illus., MARSUPIALIA, vol. IX.

DA'TARY, an assistant to the pope, sometimes called chancellor. To relieve the pope of unimportant business he has power to grant certain requests, in which he is assisted by a *pro* and a *sub* datary.

DATE (Lat. *datum*, given), the precise time at which a document was written, or an event happened. The importance of accurately ascertaining the date of an event or writing is very obvious, but the difficulty which there may be of doing so is not so apparent. It might be thought, for example, that, at least in modern times, where the day of the month and year are authoritatively set down, there can be no room for any further question; but it is not so. If, for instance, we refer to a newspaper of the reign of queen Anne, we shall see the *Amsterdam Gazette* of the 22d Feb. translated in the *London Gazette* of the 13th Feb., and abridged in the *Edinburgh Courant* of the 19th Feb., all of the same year, 1705. And this is but one of several seeming inconsistencies or contradictions of the same sort.

In the first place, the difference in the two *styles* by which dates are reckoned may cause a discrepancy of ten, of eleven, or of twelve days, according to the century to which the date belongs. Until 1582 there was but one style or calendar throughout Europe; but in that year Pope Gregory XIII. introduced the "new style" or "Gregorian calendar," which at once corrected the long-accumulated errors of the old method of computing time, by declaring the 5th to be the 15th of Oct., 1582, or, in other words, by striking ten days out of the almanac of that year. The new style was adopted generally in Roman Catholic countries. Most Protestant countries, on the other hand, continued for a longer or shorter period to use the "old style," or "Julian calendar." It is necessary, therefore, in dealing critically with dates after 1582, to ascertain what "style" was in use at the time and place in question. This, in not a few cases, may call for some inquiry; but generally, the following table will serve to show when the chief states of Europe adopted the new style:

Year.	Country.
1582.	Great part of Italy, France, Lorraine, Portugal, Spain, Holland, and the greater part of the Netherlands.
1584.	The Roman Catholic parts of Germany and of Switzerland.
1586.	Poland.
1587.	Hungary.
1682.	The city of Strasburg.

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Year.	Country.
1700.	The Protestant parts of Germany and of Switzerland, Guelders, Zutphen, Utrecht, Friesland, Groningen, and Overyssel.
1749 or 1751.	Tuscany.
1752.	Great Britain and Ireland: American colonies soon thereafter.
1753.	Sweden.

In Russia and Greece the old style is still followed, and it obtains generally in the east. Thus, what was the 12th Jan. 1879 at Paris and London, was the 31st Dec. 1878 at Athens and St. Petersburg.

But difference of *style* is not the only cause of perplexity in dates. Countries using the same style, and therefore agreeing as to the day of the *month*, may differ as to the *year* to which they refer an event. Thus the beheading of king Charles I. was reckoned, both in England and in Scotland, to have taken place on the 30th of Jan.; but while England held the year to be 1648, Scotland held it to be 1649. The cause of this discrepancy was the difference which obtained as to the beginning of the year. By the English, the year was held to begin on the 25th of Mar.; by the Scots, on the 1st of Jan. It becomes necessary, therefore, in considering dates, to keep in view not only the style which was used, but the day on which the year was accounted to commence. There was much variation in this respect, not only between one country and another, but even in the same country as between one time and another, as well as between its different provinces at the same time. The new years' days most commonly used were the Nativity or Christmas (25th Dec.), the Circumcision (1st Jan.), the Annunciation or Lady Day (25th Mar.), and the Resurrection or Easter. The 1st of Jan. was adopted as the commencement of the year by France in 1563, by Scotland in 1600, by England in 1752. In this last country, the inconvenience of dating by a different year from most of the other great European states had been so generally felt that for some time before the new mode of computation was sanctioned by act of parliament, dates falling between 1st of Jan. and 24th Mar. were commonly expressed in both ways, thus: 2d Feb. 107$\frac{1}{2}$, or 1706–7, the lower or last figure indicating the year according to the present reckoning.

Hitherto, we have spoken of dates where both the year and the day of the month are set down in figures. But in ancient writings, even where the year is expressed in figures, nothing is more common than to indicate the day of the month only by reference to some festival or other peculiarity in the service of the church. Thus, an English letter of the latter part of the 15th c. is dated in this way: "Written at Paston, in haste, the Wednesday next after *Deus qui errantibus;*" that is, the first Wednesday after the third Sunday after Easter, on which day that portion of the church service which is called the *introit* begins with the words *Deus qui errantibus*. So, again, as late as the year 1610, the battle of Weissenburg, near Prague, is described by the contemporary chroniclers as having been fought "upon the Sunday on which the church sings *Reddite quæ sunt Cæsaris Cæsari;*" that is, the 22d Sunday after Pentecost, which, in the year referred to, fell upon the 8th Nov. A still more common way of dating was by reference to a saint's day. Thus, the English parliament which met at Westminster on the 6th Oct., 1399, is described in the contemporary record as meeting "on Monday, the Feast of St. Faith the Virgin;" and the Scottish parliament which met at Scone on the 3d Dec., 1318, as meeting "on the Sunday next after the feast of St. Andrew the Apostle." In order, therefore, to interpret all this class of dates—and it is a very large one—recourse must be had to the calendar and service books of the church, or to the "glossaries of dates" and "catalogues of saints' days" which antiquaries have compiled from them. See CALENDAR: DAY.

For centuries, it was more common to date by the year of the king's reign than by the year of our Lord. The risk of error in reducing this way of computation to that now in use is such, that in Rymer's *Fœdera*, a great collection of English state papers, printed at the public expense, in the beginning of the 18th c., many documents of all the reigns from Richard I. to Edward IV. are misplaced by a whole year. These mistakes arose chiefly from insufficient inquiry as to the day from which the king dated his reign. This was assumed to be from the day of his predecessor's death, but in point of fact the early English sovereigns dated their reign only from the day of their coronation. Where a D., therefore, has to be ascertained by reference to a regnal year, it becomes necessary to make sure not only of the time when the king came to the throne, but of the very day from which he reckoned his reign. In the case of the popes of Rome, this inquiry is at once more than usually necessary, and more than usually troublesome, inasmuch as, until comparatively recent times, scarcely any two of them in immediate succession dated or computed on the same principle. Not a few of them, indeed, adopted different computations at different times of their reign. Thus, Pius II., during his pontificate of six years (1458–64), commenced the year sometimes on the 25th Dec., sometimes on the 1st Jan., and sometimes on the 25th Mar. Some popes, again, dated from the day of their election; others, from the day of their consecration or coronation. Nor is it only in interpreting regnal years into modern chronology that there is a chance of error; there is proof that occasionally the regnal years were wrongly computed at the time, by the kings themselves, or rather by the officers who wrote their

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charters. Thus, for example, it has been discovered that from the time that king David II. of Scotland returned from captivity in 1357, the year given as that of his reign is one year short of the truth. In dealing with regnal years, there is yet another risk of mistake to be guarded against. Until the 16th c., it was not common for kings to distinguish themselves by numbers from their predecessors of the same name In order, therefore, to discriminate one from another, charters or other deeds of the English Henries and Edwards, or the Scottish Roberts and Jameses, recourse must be had to such tests as the character of the writing, its seal, its style and language, and above all, the names of the persons enumerated in it.

With no other help than is to be gained from such tests, the antiquary is often called on to fix the date of a charter, containing no reference to the year of our Lord, the year of the king's reign, the year of the pope's pontificate, or any other measure of time. If the persons mentioned in the deed be men of note, he may be able to ascertain its date to a year, a month, or even a day; on the other hand, if they are obscure, he may be unable to reduce the date within a narrower range than 50 or even 100 years.

The skill of the antiquary is not unfrequently put to the proof in another way. Dates were often recorded by reference only to an event of the time. Thus, one leaf of the Scottish statute-book contains two acts of parliament, with no more explicit record of their date than that the one was passed "at Aberdeen in Lent next after the coming in Scotland of Vivian the legate of the apostolic see;" and that the other was passed at Stirling "on the Monday next before the feast of St. Margaret the maiden next after the first coronation of Philip king of the French." An examination of contemporary chronicles fixes the date of the one statute to 1177; of the other to 1180.

In order to facilitate the discovery and rectification of dates, various elaborate works have been published. By far the most important—*L'Art de Vérifier les Dates des faits Historiques, des Chartes, des Chroniques et autres Monuments*—is due chiefly to the labors of the Benedictines of St. Maur. The best edition of this admirable work is that of Paris, in 8 folios, the first three containing the period from the birth of Christ till the year 1770, being published in 1783–87; the fourth containing the period before the birth of Christ, in 1820; and the last four, continuing the work from 1770 downwards, in 1821–38. A reprint of this edition, in 42 octavos appeared at Paris in 1818–44. Of the other French works, it will be enough to name two—the *Nouveau Traité de Diplomatique*, also by the Benedictines of St. Maur (Par. 1750–65, in 6 vols. 4to), and the *Eléments de Paléographie, par Nat. de Wailly* (Par. 1838, in 2 vols. 4to). The best English work is *The Chronology of History*, by the late sir Harris Nicolas, published in Lardner's *Cabinet Cyclopædia*, 1838. Haydn's *Dictionary of Dates* (latest edition, 1889) is a standard popular work. See INTERNATIONAL DATE LINE.

DATE OF DEED. See DEED.

DATE PALM (*Phœnix*), a genus of palms, the most important species of which is the common DATE PALM, the *palm tree* of Scripture (*Ph. dactylifera*), a native of the northern half of Africa, the s.w. of Asia, and some parts of India, and which has also been brought into cultivation in the s. of Europe, and might certainly be introduced with advantage into the s. of the United States, and many warm parts of America and Australia. The stem, which is straight and simple, reaches a height of 30 to 60 ft., and bears a head of 40 to 80 glaucous pinnated leaves, of 8 to 10 ft. long, with lanceolate acuminated leaflets, very much closed up, and a number of branching spadices, each of which on the female tree bears in general 180 to 200 fruits (dates, *dactyli*). A bunch of dates weighs 20 or 25 pounds. This is one of the most important and useful of all the palms, and is indispensable to millions of the human race, on account of the supply of food which it affords them. In Egypt and the other countries on the n. coast of Africa, in Persia, and in Arabia, dates form the principal food, and date palms the principal wealth, of the people. The fleshy part of the fruit contains 58 per cent of sugar, accompanied by pectin, gum, etc. The main ingredient, therefore, in a dietetic point of view, is the sugar. The fruit is eaten either fresh or dried, and in the latter state becomes an article of commerce. Cakes of dates pounded and kneaded together, and so solid as to be cut with a hatchet, are the store of food provided for African caravans on their journey through the Sahara. A liquor resembling wine is made from dates by fermentation, and also a kind of vinegar. In Persia, an ardent spirit is distilled from dates. The soft pith at the summit of the palm stem, along with the young leaves not yet unfolded, are eaten under the name of *palm cabbage*, and the undeveloped panicles of flowers also form an article of food to the Persians and Arabs. The liquor called *palm wine* is prepared by fermentation from the sap of the palm, the top being cut off, and a hollow scooped out, in which the sap collects. Three or four quarts are obtained daily from a single palm for ten days or a fortnight. The quantity afterwards diminishes, till the tree becomes quite dried up. Many of the inhabitants of North Africa use the roasted date stones or seeds as a substitute for coffee, for which purpose the seeds of the *Phœnix reclinata* are also employed in the s. of Africa. The seeds or stones of dates are in many places ground for the sake of the oil which is afterwards obtained from them by expression, and the remaining paste or cake is given as food to cattle. From leaf-stalks of the common D. P., all kinds of basket and wicker work are also made, and walking-sticks, fans, etc. The leaves themselves are made into bags, mats, etc.;

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the fibers of the web-like integuments at the base of their stalks into cordage. The wood is used for building, fences, etc.—The TODDY PALM of the n. of India, or wild D. P. (*Ph. sylvestris*), so nearly resembles this species, that it is doubtful if it is distinct. In some places, the trees present a curiously distorted and zigzag appearance, from the practice of yearly tapping the alternate sides for the sap or *toddy*. The incision is just below the crown, and slopes upwards and inwards; a vessel is hung below the wound, and the juice conducted into it by a little piece of bamboo. It forms a grateful and wholesome beverage; readily also fermenting into palm wine, and by distillation yielding *arrack* (q.v.); whilst, if boiled down without being allowed to ferment, it yields the saccharine syrup called *jaggery*, from four pounds of which one pound of sugar is obtained, a single tree producing about seven or eight pounds of sugar annually. The operation of tapping for toddy spoils the fruit of the tree, which is small and much inferior to the African date. It is, however, eaten.—Another species, *Ph. paludosa*, the most gregarious of Indian palms, growing only six or eight ft. high, covers the whole landscape of the Sunderbunds with the liveliest verdure. *Ph. acaulis*, *Ph. farinifera*, and *P. spinosa*, are three other closely allied species; the first grows in the driest soils in the damp valleys of the Himalaya to 5,000 ft. above the sea. All three are dwarf species. See illus., TREES, ETC., vol. XIV.

DATE PLUM, *Diospyros*, a genus of plants of the natural order *ebenaceæ*, consisting of deciduous trees, whose fruit is a globose berry, natives of warm or temperate climates. The black heartwood of some species is ebony (q.v.), and the hard timber of others is known as IRONWOOD. Some are valued for their fruit. The COMMON DATE PLUM, or PISHAMIN, also called the EUROPEAN LOTUS and the DATE OF TREBIZOND (*D. lotus*), is a tree of 20 to 40 ft. in height, with oblong shining leaves and small reddish white flowers, a native of the coasts of the Caspian sea, Mauritania, etc., but cultivated and naturalized in the s. of Europe. Its fruit is of the size of a cherry, and in favorable climates larger, yellow, sweet, and astringent. It is eaten when over-ripe, like the medlar, or is used for conserves. The tree bears fruit abundantly in the neighborhood of London, but is somewhat tender in the climate of Britain, and its fruit more austere than in more southern regions. This fruit has been supposed by some to be the *lotus* (q.v.) of the lotophagi. The VIRGINIAN DATE PLUM, or PERSIMMON (*D. Virginiana*), is a tree of 30 to 60 ft. high, with ovate oblong leaves and pale-yellow flowers, a native of the southern states of North America, where one tree often yields several bushels of fruit. The fruit is about the size of a bullace, reddish, with six to eight oval seeds. It is not palatable till mellowed by frost, and is sweet and astringent. A kind of beer or cider and an ardent spirit are made from it.—The *mabola* (*D. mabola*) is cultivated as a fruit-tree in the isle of France. Its fruit is about the size of a quince, and has a very agreeable flavor.—The *kaki* (*D. kaki*), sometimes called the KEG-FIG, is a Japanese tree, sometimes kept in green-houses in France and England. The sweetmeat called *figues-caques* is made from this fruit in France. The fruit resembles a plum. It is occasionally brought from China as a dried sweetmeat.—The fruit of some other species of *diospyros* is also edible, as that of *D. decandra*, a large yellow berry, which, notwithstanding a disagreeable smell, is sold in the markets of Cochin-China.

DAT'HOLITE, a mineral of a grayish or greenish white color, occurring both massive and crystallized in rhombic prisms, the edges and angles of which are cut off by planes. It is composed of boracic acid, silica, and lime, with a little water. It has been found both in gneiss and in trap rocks. The Salisbury crags and Corstorphine hill, near Edinburgh, are localities for datholite.

DATISCA'CEÆ, a small natural order of plants, allied to *begoniaceæ*, and consisting of herbs and trees, chiefly natives of the temperate parts of the northern hemisphere. *Datisca cannabina*, a plant much resembling hemp in its general appearance, a native of Crete, possesses very marked tonic properties. It contains also an amylaceous substance, called *datiscin*, resembling inulin. It affords a yellow dye.

DA'TIVE. See DECLENSION.

DATU'RA. See THORN APPLE.

DAUB, KARL, 1765–1836; a German theologian, educated at Marburg, where he was tutor for a time. In 1794, he was professor of philosophy at Hanau, and soon afterwards of theology at Heidelberg, which office he held during life. His writings are of much importance, since they reflect the influence upon theology exercised by the several schools of philosophy prevailing during his time.

DAUBENTON, LOUIS JEAN MARIE, a French naturalist, was b. at Montbar in Burgundy, 29th May, 1716. His father wished him to be an ecclesiastic, and sent him to acquire a knowledge of theology at the Sorbonne in Paris, but D. had no inclination for this study, and gave himself up to that of medicine and anatomy. In 1741, after he had taken his degree at Rheims, he returned to Montbar to practice his profession. In the following year, however, his old school-fellow, the comte de Buffon, induced him to come to Paris, and assist him in the preparation of his great work on natural history. For this office D. was admirably qualified. The sobriety of his understanding, the scrupulous care with which he pursued the smallest investigations, his perseverance and industry, were in complete contrast to the impatient spirit and rapid generalizing of his

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brilliant coadjutor, and enabled him to correct and moderate some of Buffon's hasty theories, as well as to substantially enrich the work with a multitude of new and important facts relative to the anatomy of animals. Unfortunately, Buffon, who was exceedingly jealous, allowed himself to be influenced unfavorably in regard to D., on account of the high estimation in which the Parisian savans generally held the latter. The result was an estrangement between the two friends (who were, however, ultimately reconciled), and science suffered severely in consequence. D., who had contributed richly to the first 15 volumes of the *Histoire Naturelle*, ceased to have further connection with the work, and the subsequent labors of Guéneau de Montbéliard, Bexon, and Sonnini, but ill supplied the want which his absence created. D. now devoted himself almost entirely to his duties in the *Jardin du Roi*, in which he held an appointment. In 1778, he was made professor of natural history in the college of medicine. During the revolution, the convention also appointed him professor of mineralogy in the museum of natural history. He died 1st Jan., 1800.

DAUBER, the name of mud-wasps (family *sphigidæ*, genus *Pelopœus*), common in the United States. The female builds her nest of mud, in the form of a cone the size of a cigar. Here, in separate cells, she lays her eggs, and with each egg imprisons a spider alive, but paralyzed by her sting. When the eggs hatch, the grub feeds on the spider, passes the pupa state, gnaws through the mud of the nest and comes out a perfect wasp.

D'AUBIGNÉ. See MERLE D'AUBIGNÉ.

D'AUBIGNÉ, THÉODORE AGRIPPA, Huguenot historian and poet, was born near Pons in Saintonge, France, in 1552. He early showed a great aptitude for language; according to his own account he knew Latin, Greek, and Hebrew when only six years old, and before he was eleven he had translated Plato's *Crito*. In his fourteenth year he was present at the siege of Orleans when his father was killed. In 1567 he attached himself to the Huguenot army under the Prince of Condé. His rough manner and keen criticisms made him many enemies, and greatly tried the patience of the king. His tragedy of *Circe* was played before the court, but he did not hesitate to use the most outspoken sarcasm both against the king and other members of the royal family. After the king's assassination (1610) he retired to Geneva and spent the remainder of his life in literary work. His best-known work, *Histoire Universelle*, is a lively account of incidents in camp and court life, and forms a valuable source for the history of France for the period it covers. This work had the honor of being burned in France by the common hangman. He died at Geneva in 1630, leaving two sons, one of whom, Constant, was the father of Madame de Maintenon.

DAUBIGNY, CHARLES FRANÇOIS, 1817–78; French artist; pupil of Paul Delaroche. He received a medal of the first class at the universal exhibition of 1867. He was one of the leaders of the naturalistic school.

DAU'CUS. See CARROT.

DAUDET, ALPHONSE, b. Nîmes, Provence, 1846; one of the most popular of living French novelists. His earlier works were, *Lettres de Mon Moulin*, *Contes du Lundi*, *Tartarin de Tarascon*, and *Robert Helmont*. These works revealed a genius of rare quality, full of brightness and warmth, with all the spontaneity and loquacity of the Provençal, and a wonderful observation of all external things, lightened by the ray of fancy and the tremor of feeling. Some of his later works, especially *Jack* and *Le Nabab*, show distinct traces of the influence of Dickens. *Fromont Jeune et Risler Aîné*, *Le Nabab*, *Les Rois en Exile*, and *Numa Roumestan* are galleries of contemporary Parisian figures. Among other works are *L'Évangéliste*, *Sapho*, *Tartarin sur les Alpes* (1886), *L'Immortel*, (1888), *Port Tarascon* (1890). D. 1897.

DAUDET, LOUIS MARIE-ERNEST, brother of the above, novelist, historian, and political writer, was b. at Nîmes May 31, 1837. His numerous works of fiction include *Thérèse* (1859); *Henriette*, *Jean de Gueux*, and *Le Prince Pogoutzine*; his political works, *La Vérité sur la Fusion* (1873), and *Souvenirs de la Présidence du Maréchal MacMahon* (1880), and his autobiographical works, *Mon Frère et Moi* (1882).

DAUMIER, HONORÉ, a celebrated French caricaturist, was born at Marseilles in 1808. Fashion, tittle-tattle, scandal, politics, blemishes of figure, and oddities of character have in turn inspired his inexhaustible genius for mockery. Few among his illustrious contemporaries ever escaped his pencil, and the worst of it is, that his caricatures have always some strikingly truthful feature about them. D. made his *début* in the *Charivari*, in a series of sketches from *Robert Macaire*, after which followed *Les Actualités*, *Les Divorceuses*, *Les Femmes Socialistes*, *Les Philanthropes du Jour*, *Les Grecs*, *Les Gens de Justice*, *Les Bons Bourgeois*, *Les Pastorales*, and *Les Papas*. The revolution of 1848 suggested two of his most remarkable series—*Idylles Parlementaires* and *Les Représentants représentés*. D. was one of the contributors to the *Charivari*. He has been called by French critics the *Aristophanes* and the *Paul Louis Courier* of caricature. Died, 1879.

DAUN, LEOP. JOS. MARIA, GRAF VON, commander-in-chief of the imperial troops during the seven years' war, was the son of Wirich Philipp Lorenz von Daun, a distinguished officer in the Austrian service, and was born at Vienna, 25th Sept., 1705. Entering his father's regiment, he acquired no inconsiderable reputation during the Turkish campaigns, 1737–1739. The Austrian wars of succession also afforded him many opportunities of displaying that combination of valor and prudence for which

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he was famous. After the peace with Prussia in 1745, D. became master-gen. of the ordnance, fought against the French in the Netherlands, 1746–48, and in 1754 received the dignity of field-marshal. Before this, he had, in spite of many obstacles, introduced into the imperial army a new military system, and reorganized the military academy at Vienna. At the commencement of the seven years' war, he commanded the army of Moravia in 1757, and neutralized the defeat of the Austrians under Gen. Broune near Prague, by driving Friedrich II., who had beleaguered that city, as far as Collin, and forcing the king, after a hard-fought battle, to evacuate Bohemia. On the 14th of Oct., 1758, he gained another victory over Friedrich at Hochkirch, and but for the too late arrival of the prince of Baden-Durlach with reinforcements, would probably have annihilated the Prussian army. On the 25th of Nov., 1759, at Maxen, he compelled Fink, the Prussian gen., with 11,000 men, to surrender. After this, however, he gained no important successes. Friedrich began to understand his tactics, and to conduct his campaigns accordingly. D. died 5th Feb., 1766.

DAUNOU, Pierre Claude François, 1761–1840; a French politician. In the convention of 1792, he denied the right of that body to try the king, and voted only for his detention. He was the first president of the council of five hundred. In 1798, he was conspicuous in organizing the Roman republic. His later years were devoted to literature, and in 1807, he became keeper of the archives of France. In 1819, he was professor of history and morals in the college of France, and in 1839, he became a peer.

DAUPH'IN (Lat. *delphinus*), formerly the title of the eldest son of the French king, was originally that of the sovereign lords of the province of Dauphiné. The last of these, Humbert II., dying childless (1349), bequeathed his possessions to Charles of Valois, grandson of Philippe VI. of France, on condition that the heir-apparent to the throne of France should bear the title of D. of Vienne, and govern the province. Louis IX. conferred on the D. almost sovereign rights; but after his time these were gradually abridged, until Dauphiné was placed under the same laws as the rest of the kingdom, and the title became merely honorary. After the revolution of 1830, it was abolished altogether.

DAUPHIN, a co. in s.e. Pennsylvania, bounded w. and s.w. by the Susquehanna river, and intersected by a number of railroads; 510 sq. m.; pop. '90, 96,977. The Blue mountain crosses it near the center. The valleys are fertile. Coal and iron are abundant. The chief productions are agricultural, though there are many manufactories. Co. seat, Harrisburg, the capital of the state.

DAUPHINÉ, formerly a frontier province in the s.w. of France, now comprises the departments of Drôme, Isère, and Hautes Alpes. After the fall of the Roman empire, D. formed the southernmost part of the kingdom of Burgundy. It then passed under the dominion of the Franks, and after the dismemberment of the Carlovingian monarchy, it became a portion of the new Burgundian kingdom of Arles. It then passed by legacy into the possession of the German emperor in 1032, and remained united with Germany till the middle of the 14th c., when it was presented to France by the last of the lords of Dauphiné. See Dauphin. The old rulers of the land bore the title of dauphin (a title which probably originated in their having the figure of a *dolphin* for their crest), and the name was afterwards transferred to the district.

DAUPHIN'S CROWN is a circle of gold set round with eight fleurs-de-lis, closed at the top with four dolphins, their tails conjoined in a fleur-de-lis.

DAUW, *Equus burchellii*, a s. African quadruped, which may be regarded as intermediate between the zebra and the quagga, and is sometimes called the *zebra of the plains*, and by the cape colonists *bonte quagga* or *striped quagga*. In the language of the Bechuanas, it is called *peetsi*. It is found in numerous herds in the wide plains n. of the Orange river, is rather larger than the zebra, and of more robust figure; of a light bay color, the belly, legs, and tail white; the face, head, and body striped with black; the tail is tufted to near the root. The hoofs are much less concave beneath than those of the zebra, and are thus adapted to the plains, as those of the zebra are to the rough surface of the mountains. The D. is less easily domesticated than the quagga, but more so than the zebra.—This, or a very similar species, is found as far northwards as Congo and the Galla country.

DAVENANT, Sir William, an English poet and playwright, was b. in the year 1605 or 1606 at Oxford, where his father kept the Crown inn, a house at which Shakespeare was in the habit of stopping when on his journeys between London and Stratford. D., while still a child, had a great admiration for Shakespeare, and when only 10 years of age, on the occasion of Shakespeare's death, the precocious boy penned an ode *In Remembrance of Master William Shakespeare*. He began to write for the stage in the year 1628, and 10 years after, on the death of Ben Jonson, he was appointed poet-laureate. He afterwards became manager of Drury Lane theater, but entering into the intrigues of the civil war, he was apprehended, and cast into the Tower. He escaped, however, to France, and returning, distinguished himself so much in the cause of the royalists, that he was knighted by Charles after the battle of Gloucester. D. a second time got into difficulties, and was confined in the Tower for 2 years, when he was released, as is said, on the intercession of Milton. Once more free, he set about establishing a theater,

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and succeeded. After the restoration, he was favored by royal patronage, and continued to write and superintend the performance of plays until his death, April 7, 1668. D.'s epic, entitled *Gondibert*, a poem of about 6000 lines, is now almost wholly forgotten.

DAVENPORT, city and co. seat of Scott co., Ia., on the w. bank of the Mississippi river, below the upper rapids and opposite Rock Island, Ill., with which it is connected by an iron railroad and carriage bridge, built at a cost of $1,200,000. It is 330 m. n. of St. Louis and 183 m. w. by s. of Chicago, and is entered by the Chicago, Rock Island and Pacific, and Chicago, Milwaukee and St. Paul, and other railroads. D. was founded in 1835, and incorporated as a city in 1851. It is situated on the top and slope of a steep bluff, and commands an extensive view. On the island of Rock Island, crossed by the great bridge, are the U. S. arsenal and military headquarters and other government buildings. The city has a city hall, court-house, opera-house, numerous churches, the academy of the Immaculate Conception and St. Ambrose's college (both R. C.), Griswold college and Kemper hall (both P. E.), state orphan home, a branch of the state soldiers' home, and an academy of natural science. It is the see city of the P. E. church in Iowa and of a diocese of the R. C. church. A rich agricultural region lies about the city, and the shipment in produce is large, while the coal mines in the vicinity increase the value of its trade. The manufactures of carriages, farming tools, machinery, lumber, flour, woolen goods, cordage, glucose, pottery, etc., employed a cap. of $8,732,122 in 1890, and produced articles valued at $10,357,232. There are lines of steamboats to St. Paul and St. Louis, and the river trade is very large. There are national and savings banks, water and gas works, electric railways, public library, law library, and many daily, weekly, and monthly periodicals. Pop. '90, 26,872.

DAVENPORT, Edward Loomis, b. Mass., 1814; d. Penn., 1877; an American actor. He made his first appearance in Providence, R. I., playing a minor part in *Sir Giles Overreach*, with the elder Booth as "Sir Giles." Davenport made rapid progress, and was soon recognized as a leading artist in tragedy, comedy, and melodrama. He supported Anna Cora Mowatt Ritchie in a wide range of characters both in this country and in England, and played with Macready and other stars. While in England he married Mrs. Vining, herself an actress, of a family of actors. Returning about 1860, he traveled over the United States, playing in the principal cities, chiefly in Shakespearean characters and those drawn from Dickens's novels. Among his latest conspicuous representations were such widely divergent characters as "Brutus" in *Julius Cæsar* and "Bill Sykes" in *Oliver Twist*. Davenport was highly esteemed for his genial and open-hearted manners.

DAVENPORT, Fanny Lily Gipsy, actress, was born in 1850, in London, England. She was the daughter of E. L. Davenport, and was educated in the Boston public schools. She first appeared publicly at the Howard Athenæum in Boston, as the child of "Metamora." She played at Niblo's Garden in February, 1862, as "King of Spain," in *Faint Heart Never Won Fair Lady*. This was followed by a season in soubrette parts at the South. While playing at the Arch Street Theatre, Philadelphia, then under the management of Mrs. John Drew, she attracted the attention of Augustin Daly, who promptly, in recognition of her abilities, gave her a place in his Fifth Avenue Theatre, in 1869. Since then she has visited the principal towns and cities of the United States as a "star," her greatest successes being in the title *rôles* of *Fédora*, *Theodora*, and *Cleopatra*.

DAVENPORT, John, 1597–1670; b. Coventry; one of the most eminent of the Puritan divines who came to New England. Graduated at Brazen-nose coll., Oxford; rector, St. Stephen's, London; but becoming a non-conformist, fled to Holland in 1633. Four years afterwards he came to Boston, and in 1638 was one of the founders of the New Haven colony. Goffe and Whalley, the regicides, were protected by him. In 1668, he became minister of the First church in Boston, and died in that charge. He was a minister in New Haven for 30 years, and was active in the civil government.

DAVENPORT, John Isaacs, b. Brooklyn, 1843; was educated at the Brooklyn Polytechnic institute; was engaged as a reporter on several New York papers. In the late civil war he served as chief of the bureau of military information, and as asst. provost marshal of the army of the James and was breveted capt. for meritorious services. He was admitted to the New York bar, 1865; as the attorney of the Union League Club, he aided the congressional committee appointed at the solicitation of that body, in the drafting and passage of several election and naturalization bills known as the election act of Feb. 28, 1871, to prevent and punish election frauds. He was appointed, 1870, U. S. commissioner for the southern district of N. Y.; and, 1871, U. S. chief supervisor of elections, both of which positions he still holds, and whose duties he has administered with notable energy. The election law for New York, drawn by him and Geo. M. Lyon, has proved very efficient. He has published *The Wig and the Jimmy*, *Election Frauds and their Remedies*, *The History of the Forged Morey Letter*, and many other pamphlets. D. is a descendant of the Rev. John Davenport who with Theophilus Eaton, founded the colony of New Haven, Conn., 1638; also of Col. Abraham Davenport whose devotion to duty Whittier has commemorated.

DAVID (Heb. "beloved"), king of Israel, the 9th and youngest son of Jesse, belonged to the tribe of Judah, and was probably educated in one of the schools of the prophets.

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He first publicly signalized himself by slaying Goliath of Gath, a gigantic Philistine, who had "defied the armies of Israel." Previously, he had acquired a considerable reputation as a skillful harper, and had subdued by his music the paroxysms of insanity which afflicted Saul at certain seasons. By Samuel he was anointed king during the life-time of Saul, who soon began to regard him as a dangerous enemy, and persecuted him. A kind of intermittent war between the two was the consequence, in which D. was often reduced to great straits. At first, he was simply in the position of a guerrilla chief, and his comrades were mainly persons in desperate circumstances—"all who were in distress, in debt, or discontented." Latterly, he lived among the Philistines as one of themselves, and from the Philistine prince of Gath obtained a present of the strong fortress of Ziklag, after which he was joined by a class very different from his original outlaws—men of consideration, and tried warriors, from various tribes. The contest between him and Saul now assumed the dignity of a civil war. It was only closed by the death of the latter, whereupon D. ascended the throne of Judah, with the city of Hebron as his capital. The other tribes elected Ishbosheth, a son of Saul, to be their king, after whose murder D. first acquired possession of the entire kingdom, over which he ruled from 1055 until his death in 1015 B.C. His first undertaking in his new office was a war against the Jebusites. He took their chief city, Jerusalem, and made it his residence, as also the center of the religious worship of the Hebrews. Subsequently, he subjugated the Philistines, Amalekites, Edomites, Moabites, Ammonites, and, after a long war, the Syrians. His kingdom now stretched from the Euphrates to the Mediterranean, and from Syria to the Red sea, and contained a pop. of 5,000,000. He fostered navigation and trade, especially with Tyre, and sought to instruct the Hebrews in the arts. No less careful was he of the religion of his countrymen. He divided the priests and Levites into classes, and appointed sacred singers and poets for the musical service of God. Law and justice likewise received improvements at his hands, through the institution of higher and lower judiciary courts, while he secured the stability of his power by the formation of a standing army. Besides this, there were 12 governors over the tribes of Israel, "who may perhaps be compared to the lord-lieutenants of English counties." D. was not, however, without his trials. Two conspiracies were formed against him in his own family, and although both failed, they greatly imbittered his life. His sensual excesses also drove him into acts of criminality, the memory of which haunted him forever. "My sin is continually before me." Yet we cannot help recognizing in the man, in spite of all his errors and sins, a sincerity of moral feeling rarely equaled in history. His passions might lead him astray, but they never blinded his conscience. The crime once committed, D. never tried to find excuses for it, and so blunt the edge of his deserved misery. The Psalms which he has left reveal to us the naked soul of the royal poet wrestling with a host of black troubles, fears, and doubts, out of which, however, as from the seething bosom of chaos, there emerges at last a "full-orbed faith," made perfect by suffering and much tribulation. There has never been trust in God more clear, unwavering, and tender than that expressed in the 23d Psalm. It is this many-sided experience of life that has made the "Psalms of David" (though it is uncertain who made the collection, which contains many not written by David himself) the most precious heritage of the afflicted and tried in all ages of the Christian church.—By those theologians who look upon Jewish history as having a *typical* or *allegorical* meaning as well as a literal one, D. is regarded as a type of Christ.

DAVID I. (often called ST. DAVID), king of Scotland, was the youngest of the six sons of king Malcolm Ceanmohr, by his second wife, the Anglo-Saxon princess, St. Margaret (q.v.). He was b. about the year 1080. During the fierce struggle for the Scottish crown, which followed the death of his father in 1093, the youthful D. seems to have found refuge in England, along with his sister, Eadgyth or Matilda, who, in 1100, married Henry I., king of England. The residence of D. at the court of this accomplished monarch would appear to have been prolonged for several years, and the assertion of a contemporary English annalist may well be credited, that "it freed him from the rust of Scottish barbarity."

In 1107, his elder brother, Alexander, succeeded to the throne, and D. became prince of Cumbria, a territory which comprised what are now the shires of Cumberland, Dumfries, Roxburgh, Selkirk, Peebles, Lanark, Dumbarton, Renfrew, and Ayr, and was held of the English king by the heir of the king of the Scots. Along with this great principality, he seems to have held lands in Lothian; and by his marriage in 1110 with Matilda, widow of the earl of Northampton, he acquired possession of that earldom, together with a claim to the rest of the vast domains of her father, Waltheof, earl of Huntingdon, of Northampton, and of Northumberland. The first act of D., as prince of Cumbria, was to restore the fallen bishopric of Glasgow, which he committed to the charge of his old preceptor, John. His next act was to bring a colony of Benedictine monks from the newly-founded monastery of Tiron, in France, and to plant them beside his forest castle of Selkirk. This was in 1113; and even thus early, as his charters show, he had gathered round him the Bruces, the Lindsays, the Morvilles, the Umfravilles, the Percies, the Riddels, and other Anglo-Norman knights, through whose help he was to effect such a momentous change in Scotland.

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In 1124, he succeeded to the Scottish throne, on the death of his brother, king Alexander I. That prince had had to fight for his crown against the heirs of the old Celtic dynasties, supported by the wild tribes of the north and west. They renewed the struggle with his successor, first in 1130, when they advanced almost to the gates of Brechin; and again, about twenty years later, when they appear to have been encountered on the plains of Murray. On both occasions, the Anglo-Norman chivalry with which D. had garrisoned the southern provinces, gave him decisive, but far from easy victories. He was less fortunate in his wars beyond the Tweed. In 1127, he had sworn, along with the other great barons of England, to maintain the right of his niece, Matilda, as heir of the English crown, should her father, Henry I., die without male issue of his own body. The event thus contemplated came to pass in 1135, and when Stephen mounted the English throne, D. took arms in behalf of Matilda, and subdued almost all the country to the s. of Durham. Peace was restored by the grant of the earldom of Huntingdon, and the promise of the earldom of Northumberland, to D.'s son Henry, then in his 20th year. But the war was soon resumed; and in 1138, the king of Scots, deserted by Bruce and others of his Anglo-Norman vassals, was signally defeated in "the battle of the Standard," near Northallerton. The next year, a second peace was concluded between the two kings, when the promised earldom of Northumberland was bestowed on D.'s son Henry. In 1141, the Scottish king marched into England for the third time to assert the rights of Matilda. He was a third time defeated, and only regained his own country with difficulty.

The rest of his reign was devoted to the accomplishment of the great revolution which had been begun by his father, king Malcolm, and his mother, St. Margaret, and continued by his brothers, king Edgar and king Alexander—the establishment in Scotland of the civilization which obtained in England. By building castles, he secured the peace and safety of the country; by erecting burghs, he promoted its trade, shipping, and manufactures, and laid the foundations of its freedom; by endowing bishoprics and monasteries, he provided homes for the only men of learning and enlightenment known in his time. His descendant, king James I., standing by his tomb in Dunfermline, is said to have complained that "he was ane sore sanct for the crown.

King D. died at Carlisle on the 24th May, 1153. His son Henry had died in the previous June, and he was succeeded by his grandson, Malcolm, then in his twelfth year. The oldest Scottish painting now known to exist—an illuminated charter to the monks of Kelso, written in 1159—preserves rude miniatures of the young king and his saintly grandfather. It is engraved in facsimile in the *Liber S. Marie de Calchou*, presented to the Bannatyne club by the duke of Roxburghe in 1846. Some pleasing traits of king D.'s personal character—which seems to have been in many ways truly admirable—are preserved in the *Eulogium Davidis Regis Scotorum*, by his friend St. Ailred, abbot of Rievaux, printed in Pinkerton's *Vitæ Antiquæ Sanctorum Scotiæ* (Lond. 1789). Other instructive materials for the king's life are supplied by the same writer in his tract *De Bello Standardi*, printed (together with other contemporary accounts of the battle) in Twysden's *Historiæ Anglicanæ Scriptores Decem* (Lond. 1652); and by Joceline of Furnes in his *Vita S. Walthevi* (abbot of Melrose, and D.'s stepson), printed by the Bollandists in the *Acta Sanctorum*, and in a less perfect state in Fordun's *Scotichronicon*. The remains of D.'s legislation, including the interesting code of the *Leges Burgorum*, have been carefully collected in the first volume of *The Acts of the Parliaments of Scotland* (Edin. 1844).

King D. is often called St. David. He was never formally canonized, or placed in the roll of saints of the Roman Catholic church; but his name was inserted in the calendar prefixed to king Charles Prayer-book for Scotland, printed at Edinburgh in 1637.

DAVID II. See BRUCE.

DAVID, FÉLICIEN CÉSAR, a French composer, b. 8th Mar., 1810, at Cadenet, department of Vaucluse. He was at first a chorister in the cathedral at Aix, and at the age of 20 entered the Paris conservatoire. He threw himself earnestly into the social speculations of his day; became an ardent disciple of St. Simon, and afterwards of Enfantin; and finally, on the break-up of the brotherhood attempted at Ménilmontant in 1832, he betook himself, along with eleven of his fellow-dreamers, to the east, there to realize his theory of life in undisturbed peace. The little knot of enthusiasts reached Constantinople whence they made their way to Smyrna and Cairo. As they had no means, they suffered greatly from want, sickness, and ill-usage. The plague forced them to flee from Egypt, through the desert, to the coasts of Syria. It is said that they dragged a piano with them over the sands, and often, when they rested on their toilsome march among the wild tribes of the wilderness, D., whose ear was quick to catch the native airs of the east, sent forth enchanting strains from the instrument, and made his comrades forget their misfortunes. In 1835, he reached France, and published his *Mélodies Orientales* for the pianoforte. They were unsuccessful; and D. remained in obscurity till 1844, when he brought out at the conservatoire his *Désert*, a grand *Ode-symphonie*, as he called it, the words of which were furnished by his friend and fellow-wanderer, M. Auguste Colin. Its success was sudden and complete. D. was declared a master at once, and his *Désert* was performed in all the theaters. Subsequently, he traveled through Belgium and Germany, and was everywhere greeted with applause.

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Less successful works were—*Moïse sur le Sinaï* (1846); *Christophe Colombe;* and *Le Paradis* (1847); and *La Perle du Brésil* (1851); *Herculaneum* (1859); and *Lalla Rookh* (1862). Appointed an officer of the legion of honor in 1862; and in 1869, librarian to the Paris conservatoire de musique, D. died 29th Aug., 1876.

DAVID, Gérhard, a Flemish painter born at Oudewater, Holland, about the middle of the 15th century. He went to Bruges in 1483, was married in 1496, and died there in 1523. It is not known who his master was, but he belongs to the school founded at Louvain by Stuerbout. Adrien Ysenbrant was his pupil. Several of his works are still attributed to Van Eyck and Memling, but there are three that are his beyond a doubt: "The History of the Double-dealing Judge" and "Christ Descended from the Cross," at Bruges, and the "Genealogy of the Virgin," at Rouen. He painted a number of miniatures.

DAVID, Jacques Louis, the founder of the modern French school of painting, and, according to his countrymen, "the regenerator of French art," was b. at Paris, 30th Aug., 1748, and studied under Vien both at Paris and Rome. His first efforts by no means indicated the latent tendencies of his mind. His devotion to the classic style of art was first perceptible to any extent after his second visit to Rome in 1784, where he executed his "Horatii." It excited the greatest enthusiasm. In 1787, he painted "The Death of Socrates;" in 1788, "The Loves of Paris and Helen;" and in 1789, "Brutus condemning his Son." During the revolution, he was artistic superintendent of those grand national fêtes and solemnities that recalled (but rather theatrically) the customs of ancient Greece. As a member of the convention, he voted for the death of Louis XVI.; he was a hot Jacobin, and a member of the committee of public safety, in all the atrocities of which he shared, and, in consequence, was twice imprisoned after the fall of Robespierre. To the period of the revolution belong his "Murder of Marat," "Murder of Pelletier," and his "Oath taken in the Tennis Court." His genius culminated in the "Rape of the Sabines" (1799). In 1804, Napoleon appointed him his first painter, and gave him a number of commissions, and among his best and most celebrated works are several historic portraits of the emperor, such as "Napoleon crossing the Alps." D. was warmly attached to Napoleon, and in 1814, when the duke of Wellington paid a visit to his studio, and expressed a wish that the artist would paint his portrait, he coldly replied, "I never paint Englishmen." As one of the regicides of Louis XVI., he was banished in 1816 from France, and he died in exile at Brussels, Dec. 29, 1825. D.'s later style is more free and natural than his earlier, in which his figures, although manifesting quite an ideal beauty of form, have all the rigidity of sculpture, and lack that vital expression which creates a sympathy in the mind of the beholder. Among the paintings executed by him during his banishment were—"Love and Psyche," "The Wrath of Achilles," and "Mars disarmed by Venus." The number of his pupils who acquired distinction was very great.

DAVID, Pierre Jean, a French sculptor, commonly called David d'Angers, was born at Angers, 12th Mar., 1789; went to Paris when very young; and studied art under his namesake, Jacques Louis David (q. v.). In 1811, his "Death of Epaminondas" obtained the first prize for sculpture given by the academy of arts. D. now visited Rome, where he formed a friendship with Canova. In 1816, he returned to France. A statue of the great Condé, which he executed about this time, established his reputation. In 1826, he was named a member of the institute, and appointed a professor in the school of the fine arts. Two years later, he went to Germany, where he executed a colossal bust of Goethe for the library at Weimar; and in a second tour in 1834, similar busts of Dannecker, Schelling, Tieck, and Rauch, as well as many portrait-statues of life size. During the July revolution, D. had fought in the ranks of the people, and, in consequence, he was employed by the new government to execute the frontispiece of the Pantheon in 1835. He finished it in 1837. By many it is considered his *chef-d'œuvre.* In 1848, the well-known republicanism of the artist procured for him the honor of a seat in the constituent assembly. After the *coup-d'état,* he was sent into exile, and went to Greece, but soon after returned to France. He died 5th Jan., 1856. It would be impossible to enumerate all D.'s works. The principal are—"A Young Girl at the Tomb of Botzaris," "A Monument of Bonchamp," "A Virgin at the Foot of the Cross," a "Saint John," statues of Gen. Foy, Marshal St. Cyr, Corneille, Fénelon, and Racine, and busts of La Lafayette, Béranger, Rossini, Chateaubriand, Balzac, and Casimir Delavigne. There is great force of expression in many of D.'s works, but the drawing and execution are not always accurate.

DAVID, or **DEWI,** Saint, the patron saint of Wales, was, according to tradition, the son of the Prince of Ceretica (Cardiganshire), and was born about the end of the 5th or beginning of the 6th century. Having resolved on a religious life, he spent, as was customary in those days, a probationary period in solitude, after which he commenced preaching to his countrymen. He built a chapel at Glastonbury, and founded twelve monasteries, the chief of which was at Menevia, in the vale of Ross. At the synod of Brevy, in Cardiganshire, held in 519, St. D. showed himself a strong opponent of the Pelagian heresy. Subsequently, he became archbishop of Caerleon-upon-Usk, but transferred his see to Menevia, now called St. Davids, where he died about the year 601. St. D. was celebrated for his eloquence and success in conversion. Several works have

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been ascribed to him, but these are no longer extant. His life was written by Ricemarch, bishop of St. David's, who died about the year 1099.

DAVIDISTS, the name of two distinct sects in the Christian church. 1. Followers of David of Dinant, whose work was condemned by the synod of Paris in 1209. His fundamental idea was that the Deity alone had any real existence, being the *materia prima* of all things. 2. DAVIDISTS, or DAVID GEORGIANS, followers of David George, or Joris, a native of Delft, Holland. In 1530, he was whipped, had his tongue bored, and was imprisoned for obstructing a Roman Catholic procession. He founded a sect of his own, and in 1542, published his *Book of Wonders*, detailing the visions which he professed to have received. After his death, his body was dug up and burned by order of the senate of Basel, where he had passed the latter part of his life as a merchant under an assumed name. The sect, under the leadership of Henry Nicholas, became known in Holland and England as the "Familists." They interpreted the whole of Scripture allegorically, and maintained that as Moses had taught hope and Christ had taught faith, it was their mission to teach love, the service of which was the highest and best of the dispensations. The result was an extreme Antinomianism in practice, which attracted the notice of the authorities in both countries. Early in the 17th c., the sect was suppressed or absorbed by others.

DAVIDOFF, KARL, violoncellist, b. in Goldingen, Courland, March 15, 1838; d. in St. Petersburg, Feb. 24, 1889. He was educated at the Moscow University, and studied the violoncello under H. Schmitt, of Moscow, and Schuberth, of St. Petersburg, and harmony under Hauptmann in Leipsic. He first appeared at the Gewandhaus, Leipsic, in 1859, and was made first violoncellist in the Gewandhaus orchestra, and professor in the Leipsic Conservatorium. In 1863 he was appointed solo-violoncellist to the Emperor of Russia and professor in the Conservatory of St. Petersburg, of which he became director in 1879. He has composed works for the violoncello.

DAVIDS, ST., an ancient but now decayed episcopal city, near the western extremity of Pembrokeshire, in Wales. It is situated on the streamlet Allan, a mile from its mouth, near St. David's head, on the n. side of St. Bride's bay. It has been the seat of a bishopric since about 519, when St. David transferred the archbishop's see to St. D. (before called Mynyw, and by the Romans Menevia) from Caerleon. It was in the middle ages a large city—the great resort of pilgrims to St. David's shrine; it is now a small village, with only a few good houses besides those of the clergy. It has a fine cathedral, and splendid remains of religious houses, episcopal palace, and St. Mary's college (founded by John of Gaunt), within a high embattled wall nearly a mile in circuit. These were several times pillaged and burned by the Danes and others during the 9th and two following centuries. The cathedral, founded in 1180, on the site of the monastery of St. David, and restored since 1846, is cruciform. Its dimensions, in the interior, are as follows: length, 290 ft.; breadth, 76; nave, 124; choir, 80; transept, 120; central tower, 127 ft. high. It contains a curious movable pulpit.

DAVID'S ISLAND, in Long Island sound, a few miles e. of New York, occupied by the federal government for military purposes. Its extent is about 100 acres.

DAVIDS, THOMAS WILLIAM RHYS, b. Colchester, Eng., 1843; was educated at the univ. of Breslau; entered the civil service in Ceylon and filled various judicial appointments in that island, and was called to the bar of the Middle Temple, 1877. He has devoted himself especially to the study of Buddhism; and his works include *Buddhism: a Sketch of the Life and Teachings of Gautama, the Buddha*, 1877; a translation of the Pali parts of the *Jataka* or Buddhist Birth stories, etc.

DAVIDSON, a co. in w. North Carolina, on the Yadkin river, crossed by the Southern railroad; 580 sq. m.; pop. '90, 21,702, includes colored. Gold and silver have been found, but the chief productions are agricultural. Co. seat, Lexington.

DAVIDSON, a co. in n. Tennessee, intersected by the Cumberland river, and crossed by four railroads; 508 sq. m.; pop. '90, 108,174, includes colored. It is a fertile agricultural region. Co. seat, Nashville, the capital of the state.

DAVIDSON, GEORGE, b. 1825, in Nottingham, England, and came to the U. S., 1832. He has surveyed Washington and Puget sounds, but is known chiefly as an astronomer, having had charge of several expeditions to various parts of the world to observe transits of Venus. He is honorary professor of geodesy and astronomy at the University of California.

DAVIDSON, LUCRETIA MARIA, 1808–25; b. N. Y.; remarkable for precocity in rhyming. The first of her writings preserved were done when she was nine years old. At 16 she attended school in Troy, but health failed and she died the next year. Many of her pieces were lost or destroyed, but nearly 300 were published in a volume.

DAVIDSON, MARGARET MILLER, 1823–38; sister of Lucretia Maria, and like her a precocious verse writer. At the age of ten she composed and acted in a drama of New York society. Washington Irving was her literary patron, and under his supervision the works of both sisters were published in 1850.

DAVIDSON, WILLIAM, b. Penn., 1746, of Irish extraction; removed to North Carolina, 1750; educated in the liberty-loving Mecklenburg co.; a major in one of the first regiments raised in North Carolina for the revolutionary war. He was in the engagements at Monmouth, Brandywine, and Germantown, and advanced to the rank of lieut. col. He was killed in a skirmish with the British troops under Tarleton near the

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Catawba river, Feb. 1, 1781, but had previously been promoted to the rank of gen. Davidson college (N. C.) is named after him.

DAVIE, a co. in w. North Carolina, on the Yadkin river; 296 sq. m.; pop. '90, 11,621, includes colored. The productions are wheat, corn, oats, tobacco, etc. Co. seat, Mocksville.

DAVIES, CHARLES, LL.D., b. Conn., 1798. He graduated from the West Point military academy in 1815, and the next year became a teacher there. He rose rapidly to become professor of mathematics, and began to prepare text-books. In 1848 he took the chair of mathematics and natural philosophy in the university of New York, and in 1857 the same chair in Columbia College. His mathematical works are widely known and used. They make a sequence from primary arithmetic to the higher mathematics, and include Bourdon's *Algebra* and Legendre's *Geometry*. Of his own works the more important are those on *Surveying and Trigonometry*, the *Logic of Mathematics*, and *Dictionary and Cyclopædia of Mathematical Science*. He d. 1876.

DAVIES, HENRY EUGENE, jr., b. N. Y., 1836; educated at Harvard, Williams, and Columbia colleges, and admitted to the bar in 1857. He was an early volunteer in the service of the union when the war of the secession broke out, and rose to be maj.-gen. of volunteers, and afterward held several public offices in New York. He d. in 1894

DAVIES, Sir JOHN, a poet and statesman of some reputation, was the son of a legal practitioner in Wiltshire, and was b. in 1569. At the age of 15 he was sent to Queen's college, Oxford, where, five years after, he took his degree of B.A. having spent two of these years in the Middle Temple, where he studied law. He was called to the bar in 1595, but forfeited his privileges, and eventually was expelled from the Temple on account of certain indiscretions. He began his political career in 1601. In 1603 he was sent by James I. as solicitor-general to Ireland, and almost immediately after, he became attorney-general. He was called to the degree of sergeant-at-law in 1606, and in the spring of the following year received the honor of knighthood. On the assembling of the Irish parliament, called in 1613, D. was chosen speaker of the house of commons. In 1620, he took his seat in the English parliament as member for Newcastle-under-Lyme. He died suddenly of apoplexy, Dec. 7, 1626.

As a lawyer, the character of D. is that of a man of great learning and talent. His *Reports of Cases adjudged in the King's Courts in Ireland*, published in 1615, were the first reports of Irish cases ever published, and had a preface from the pen of D., which was esteemed by an old critic as the best that was ever prefixed to a law-book. But it is as a poet that he is chiefly notable. His *Orchestra, or a Poem on Dancing* (1596), was followed by his great work, the *Nosce Teipsum, a Poem on the Soul and the Immortality Thereof* (1599). His verse is elegant without being artificial, and flowing without being careless, while its compact structure is remarkable for his times. Among his miscellaneous works may be mentioned his *Discovery of the True Cause why Ireland was never Subdued entirely until the Reign of King James I.* (Lond. 1612), a work which has always been considered of great value to political inquirers,

DAVIES, SAMUEL, D.D., 1724–61; b. Del.; licensed to preach, 1746. In 1753, he was sent to England to solicit funds for the college of New Jersey, and was successful. On return, he resumed his pastoral work, and after the defeat of Braddock in the Indian war, he published a sermon on the disaster, in a note to which he wrote: "That heroic youth, Col. Washington, whom I cannot but hope Providence has hitherto preserved for some important service to his country." In 1759, he succeeded Jonathan Edwards as president of the college of New Jersey.

DAVIES, THOMAS ALFRED, b. N. Y., 1809; graduate of West Point. In the war of the secession he served on the union side, and at its close held the rank of brevet maj.-gen. of volunteers.

DAVIESS, a co. in s.w. Indiana, between the branches of the White river, traversed by the Baltimore and Ohio Southwestern and the Evansville and Terre Haute railroads; 430 sq. m.; pop. '90, 26,277. The surface is rolling or level, and limestone and coal are found. Agriculture is the principal business. Co. seat, Washington.

DAVIESS, a co. in n.w. Kentucky on the Ohio river; 410 sq. m.; pop. '90, 33,120, includes colored. The surface is level and the soil good. Productions agricultural. Co. seat, Owenboro.

DAVIESS, a co. in n.w. Missouri on Grand river; 576 sq. m.; pop. '90, 20,456, includes colored. Surface uneven and soil fertile; productions agricultural. Co. seat, Gallatin.

DAVIESS, JOSEPH HAMILTON, 1774–1811; b. Va., but taken at an early age to Kentucky, widely known and remembered there as "Jo Daviess." His eccentricities gave him much notoriety. On one occasion he appeared as an advocate before the supreme court in the most dilapidated attire, won an important case, and disappeared in the same garb. He married a sister of Chief-Justice Marshall, and became U. S. attorney for the state. He was killed at the battle of Tippecanoe while leading a cavalry charge against the Indians.

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DA VIN'CI, LEONARDO. See LEONARDO DA VINCI.

DAVIOUD, GABRIEL JEAN ANTOINE, 1823–81; b. Paris; studied architecture at the school of fine arts, where he carried off a number of prizes, and acquired great reputation by the important part he took in the embellishment of Paris, 1859–62. He ornamented the Bois de Boulogne, the Champs Élysées, and most of the public squares, and was also engaged on various private edifices.

DAVIS, a co. in s.e. Iowa, bordering on Missouri, intersected by Fox river and two railroads; 500 sq.m.; pop. '90, 15,258. Productions agricultural. Co. seat, Bloomfield.

DAVIS, a co. in n. Utah, lying along Great Salt lake, in part occupied by the Wahsatch mountains; 290 sq. m.; pop. '90, 6469. It is crossed by the Union Pacific and other railroads. Productions chiefly agricultural. Co. seat, Farmington.

DAVIS, ANDREW JACKSON, b. N. Y. 1826. He has long been prominent as a leader in modern spiritualism, and at the age of 19 published *The Principles of Nature her Divine Revelations*, which he claims were dictated to him by spiritual influence. He has also published *The Great Harmonica; The Magic Staff; Beyond the Valley*, an autobiography (1885), and many papers of less consequence.

DAVIS, CHARLES HENRY, LL.D., b. Boston, 1807; entered the navy in 1823, and rose to rear-admiral in 1863. In 1859, he was made superintendent of the American *Nautical Almanac*. He was one of the board of officers assembled in 1861 to consider measures for an attack along the coast of the states then beginning the civil war, which consultation resulted in the expedition against Port Royal. In May, 1862, he had command on the flotilla off fort Pillow, on the Mississippi river, and on the 10th of that month resisted a fleet of 8 confederate iron-clads which came against him, disabling three of the gun-boats. The confederates abandoned fort Pillow early in June. On the 8th of that month, Davis came up with their iron-clads opposite Memphis. He attacked them at once, captured or destroyed all but one, and the surrender of the city of Memphis immediately followed. For this and other services Davis was made rear-admiral. Subsequently he was chief of the bureau of navigation, and immediately after the war he was made superintendent of the national observatory. In 1867, he commanded the Brazil squadron, and in 1870 took command of the Norfolk navy yard. He d. 1877.

DAVIS, DAVID, LL.D., b. Md. 1815; graduated from Kenyon college, and settled in law practice in Illinois, where he was successively chosen to the legislature, to the constitutional convention, and as district judge. In 1862 he was appointed one of the justices of the U. S. supreme court. He resigned in 1877, after 15 years' service, and was chosen U. S. senator from Illinois. He was pres. *pro tem.* U. S. senate, 1881–3. His political affiliations may be described as Democratic but variable. He d. 1886.

DAVIS, HENRY, D.D., 1771–1852; a native of Long Island, graduate at Yale and tutor in Yale and Williams colleges, and held the Greek professorship at Union college. In 1809, he was elected president of Middlebury college, and in 1817, of Hamilton college, resigning in 1833 on account of difficulties with the trustees.

DAVIS, HENRY G., b. Howard co., Md., 1823; had few educational advantages; was for fourteen years in the employ of the Baltimore and Ohio railroad, beginning as a brakeman; in 1858 removed to Piedmont, West Va., and became president of a bank; served in both branches of the state legislature as a democrat; was elected U. S. senator, 1871; re-elected, 1877.

DAVIS, HENRY WINTER, LL.D., 1817–65; b. Md., graduate of Kenyon college, studying law at the university of Virginia. In 1850, he settled in Baltimore, and in 1855 was elected to congress, and was twice re-elected. He was a vigorous opponent of secession, and in 1863 was once more sent to congress. His work, *The War of Ormuzd and Ahriman in the Nineteenth Century*, appeared in 1852.

DAVIS, JEFFERSON, a soldier, statesman, and president of the Confederate States of America, born in Christian county, Kentucky, June 3d, 1808. When the boy was less than ten years old his father moved to Mississippi, and thus early in life was formed a connection with his adopted state, which became in after years a source of pride to both. He returned to Transylvania University, in his native state, for his education, and in 1824 entered the Military School at West Point, where Robert E. Lee was a college mate. A fellow cadet thus speaks of him: "He was distinguished in the corps for his manly bearing, his high-toned and lofty character. His figure was very soldier-like and rather robust, his step springy resembling the tread of an Indian brave on the war-path." He graduated in July, 1828, with the usual brevet of Second Lieutenant of Infantry. He at once entered active service on the North-Western frontier, where he remained seven years and was promoted to First Lieutenant. Even thus early in life and in his career, his vigorous mind had decided on the question of State's Rights, for in 1833, when it was believed that the Government troops would be called upon to enforce certain acts of Congress in South Carolina, which that state nullified, Jefferson Davis was prepared to resign his commission rather than be obliged to take part in the coercion of a state of the Union.

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In 1835 Mr. Davis was married to a daughter of General Zachary Taylor; she died Sept. 18th, a few months after their union. In the same year Mr. Davis resigned his commission and retired to a Mississippi plantation.

When the Mexican war broke out Colonel Davis, at the head of the First Regiment of Mississippi Volunteers, marched to the Rio Grande and joined the army before Monterey, and fought at Buena Vista, receiving there a wound that placed him upon crutches, and the effects of which he felt for five years after. Colonel Davis and his riflemen turned the tide of war by their bravery in this battle.

The political career of Mr. Davis commenced in 1843, when he first participated in local affairs, and in 1845 he was elected to the United States House of Representatives. Still pale and emaciated from the nervous pain attending his wound, and supported by two crutches, he took his seat in the Senate chamber at the first session of the thirtieth Congress, in 1847. Here he came into close companionship with John C. Calhoun (q.v.) and other distinguished men of the country.

Mr. Davis is described at this time as tall, sinewy, with great natural dignity, fair hair, gray eyes, high forehead, straight nose, thin, compressed lips, and pointed chin. His long face and hollow cheeks wore an intensity of expression corresponding to his strong, unyielding, conscientious, earnest character. On the 26th of February, 1845, he married the daughter of Mr. W. B. Howell, of Natchez, Miss., and grand-daughter of Governor Howell, of New Jersey. Mrs. Davis survives her husband, and has written an exceedingly interesting history of his life.

Stormy debates upon the slavery question, its introduction into the territories, first Oregon, then Missouri, and its final abolition were rife, and Mr. Davis was always outspoken and zealous in defending his opinions. In March, 1853, he was appointed Secretary of War in the Cabinet of President Pierce. While in this position he urged that the United States army should in time of peace prepare for war, and was instrumental in placing it upon a stronger footing. In 1857 Mr. Davis re-entered the Senate, and many of the most exciting events in the history of our country occurred during the ensuing years. They were the shadows of the coming war. The guerilla skirmishing on the plains of Kansas, arising from the attempt to force slavery into that territory; the dissensions among the Democrats upon the subject of squatter sovereignty; the discussions of the State's Rights politicians were some of the disturbing elements of these stirring times. In 1860 Mr. Davis offered, in the United States Senate, a series of resolutions which were adopted, to the effect that "the States had formally accepted the Constitution as independent sovereigns, delegating to the general government a portion of their power for the sake of security; that the intermeddling on the part of any one of them with the domestic institutions of another was not only insulting, but dangerous to the domestic peace, and tending to destroy the Union; that negro slavery was legal; and that neither Congress nor Territorial Legislature had the right to interfere with it."

On the 9th of January, 1861, Mississippi seceded from the Union, and on the 21st Mr. Davis, devoted to the doctrine of State's Rights, withdrew from the United States Senate with a speech, in which he strongly set forth his principles, and to which an immense throng listened with breathless attention. He fully justified the course of Mississippi, as a conviction of pressing necessity, if we are to be deprived in the Union of the rights which our fathers bequeathed to us. In a conversation with Honorable James Campbell, ex-Postmaster-General of the United States, Mr. Davis said: "Campbell, I love this old Union. My father bled for it, and I have fought for it; but unless you were in the South and knew our people, you could not begin to estimate the bitterness of feeling already engendered there, and which will increase if Lincoln is elected."

On the 18th of February, 1861, Mr. Davis assumed the Presidency of the Confederate States, and delivered his inaugural address in Montgomery, Alabama. Unquestionably he was the popular choice; he did not seek the office, and there was no intriguing for it. Great events now followed each other in rapid succession. Hostilities at once commenced, and battles followed which are fully described in our historical records as well as in Mr. Davis' *Rise and Fall of the Southern Confederacy*. Attempts were made to negotiate friendly relations between the United and the Confederate States. Mr. Davis experienced some opposition from the Provisional Congress, and caused some jealousy when he placed General Lee in command.

At the expiration of the first year of the Provisional Government a new Congress was elected, and a new inaugural was delivered, February 22d, 1862. The effect of the Emancipation Proclamation was unmistakable. It roused the South to a determination to resist to the uttermost a power that, as they thought, respected neither the rights of property nor constitutional guarantees. "How," said Mr Davis, "can a people who glory in a Declaration of Independence which broke the slumbers of a world declare that men united in defence of liberty, property, and the pursuit of happiness are traitors? Is it henceforth to be a dictum of humanity that man may no more take up arms in defence of rights, liberty, and property?" In May, 1862, Mr. Davis was baptized by the Right Rev. Bishop Johns, his mind having been prepared for it for some time previous. He was oftentimes greatly depressed, through reverses to

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the cause, but placed great faith in the recognition by England. At these times it was the habit of his wife to divert him with poetry and light literature.

In July, 1863, Mr. Davis addressed a letter to President Lincoln on the subject of exchanging prisoners, but insisted upon his title as President of the Confederacy. A second time he wrote expressing his views upon retaliation. He also addressed the Pope, thanking him for his sympathy. Mr. J. S. M. Curry, LL.D., says: "As a leader Mr. Davis has been regarded as a failure, although possessed of large experience in the practical art of government; but the Confederacy furnished little scope for sagacious statesmanship. The difficulties were constant and incalculable, but there was never occasion for diplomacy or legislative wisdom. Financial success was beyond human attainment. The civil was successively subordinate to the military. It was a question of how to raise troops, arm, clothe, subsist, transport them. It was unmanageable."

It is believed by those who knew him best that the character of Jefferson Davis will grow in the general estimate. "A ripe scholar, a vigorous writer, a splendid orator, a brave soldier, a true gentleman, an accomplished statesman, a sturdy champion, a proud, pure patriot, a lover of liberty, a hero—this is the Jefferson Davis that history will cherish." United States Senator Reagan says that "he was the most devout Christian I ever knew, and the most self-sacrificing man." Mr. William H. Davis, who knew him intimately, thus speaks of him: "He was one of the most lovable men I ever knew. He was always dignified, calm, and thoroughly well poised, but treated everybody around him with courtesy. He had an elevated standard of manhood, lofty integrity, remarkable ability."

After the surrender of Lee and Johnston Mr. Davis started for Washington, Georgia, with the purpose of making his way to the trans-Mississippi. A false report that his wife was in danger led him to change his course that he might join her. He travelled with her for several days, until they reached Irvinsville, Georgia, where he was surrounded and captured. Many ridiculous stories were circulated at the time of his assuming a woman's dress, etc., but as he tells the story himself, he picked up, as he thought, his own "raglan" or wrap, and it proved to be his wife's, and as he was ill and suffering, his wife threw a shawl over his shoulders when he passed her. He was taken prisoner on the 19th May, 1865, and confined in Fortress Monroe. On May 23d the order was given to place him in irons. He begged that they would not degrade him in this way, and forcibly resisted the attempt to place the manacles upon his wrists. "Let your men shoot me at once," he cried; but the order was executed. The idea that he was continually watched made him nervous, and constantly sleeping with a light affected his eyesight. He earnestly desired a public trial, and feared that he would die before he could have the opportunity to refute the charge of complicity in the assassination of Lincoln. The irons were finally removed as a medical necessity, although he was too proud to ask any favors to the last. On the 10th of April, 1866, the Judiciary Committee of the House thought there was no reason why they should not at once proceed with the trial, and on May 8th, 1866, a grand jury of the United States at Norfolk, Judge Underwood presiding, found an indictment for treason. Mr. Davis' counsel desired immediate trial, but it was not until after two years' imprisonment that he was brought before the judge at Spotswood. It is said that he stood erect, looking steadily upon the court, but without either defiance or fear. He was admitted to bail, and the first man to go on his bond was the great abolitionist, Horace Greeley. Other eminent names appeared also upon his security papers.

Was Jefferson Davis a traitor? As he was never brought to trial, the question remains unanswered. After his release from prison he visited Canada and other places, and finally retired to Beauvoir, near Biloxi, in Mississippi. "The closing scenes in the life of Mr. Davis were marked by fortitude, by the gentle courtesy which never forsook him, and, above all, by su'.lime though simple trust in the all-sufficient Saviour, bearing himself in every way so as not to bring reproach on the lost cause." He died in New Orleans on the 6th of December, 1889, of a congestive chill, combined with malaria and acute bronchitis.

The funeral services at the Episcopal Church were grand and imposing; it was a historic pageant in New Orleans. The press North and South treated most kindly the memory of this illustrious man. Instances of his self-denial and sympathy for the poor and afflicted and for the wounded and disabled soldiers are numerous. "It is now clearly demonstrated that, so far from sharing the responsibility for the sufferings of prisoners, he did his best to avert and alleviate them. He tried to get exchanges, he sent a delegation of the prisoners themselves to Washington to represent their own situation, and finally gave up Federal prisoners, sick and well, without exchange rather than have them suffer in Confederate hands." The character of Jefferson Davis has been growing more and more impressive for twenty-five years. "Collected, calm, unmoved by misfortune, unvexed by accusation, he discharged the trust reposed in him by the Southern people with the heroic and sublime devotion of a martyr. With many mistakes, and his confidence often abused, surrounded by perils within and without, his loyalty was never doubted." "He conquered himself and forgave his enemies, but he bent to none but his God." Visitors to Beauvoir, his family seat near Biloxi, Mississippi, still find all things as he left them—his books, his pictures, his easy chair, etc.—but the place, once grand and noble, has a deserted appearance; in the grounds

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the weeds run riot, and the arbors are rotting and falling with the vines; but the memory of Jefferson Davis is green in the hearts of his people.

DAVIS, Jefferson C., b. Ind., 1828. He was a volunteer in the Mexican war, and subsequently became a lieut. in the regular army. He was stationed at fort Sumter during the bombardment in 1861. He served on the union side through the war of the secession, receiving the brevet rank of maj.gen. In 1873, he commanded the forces sent to subdue the Modocs after the murder of Gen. Canby. He d. 1879.

DAVIS, John, an eminent navigator of the latter part of the 16th c., was b. at Sandridge, near Dartmouth, and is principally distinguished for having, between 1585 and 1588, undertaken three voyages to the northern seas in search of a northwest passage. In the first voyage, he sailed as far n. as the 73d degree of latitude, and discovered the strait which bears his name. He afterwards made five voyages to the East Indies, in the last of which he was killed in a fight with some Japanese on the coast of Malacca. This event took place in 1605. He is the author of *The World's Hydrographical Description* (Lond., 1595) and *The Seaman's Secrets*, 8vo (Lond., 1594), and is often confounded with John Davis of Limehouse, another navigator and author.

DAVIS, John Chandler Bancroft, LL.D., b. Mass. 1822; American statesman. He was graduated at Harvard, 1840, and became a lawyer; was sec. of legation in London, 1849–52; from 1852–61 practised law in N. Y. In 1869–71 he was assist. sec. of state and agent of the government at the Geneva arbitration; in 1871, member and sec. of the commission that concluded the treaty of Washington; 1874–77, U. S. minister to Germany; subsequently judge of the court of claims; in 1881, again, for a brief period, assist. sec. of state; in 1883 appointed reporter to the U. S. supreme court. Among his publications are *The Massachusetts Justice* (1847); *The Case of the United States at Geneva* (1872); vols. 108–18 of *U. S. Reports; Mr. Sumner, the Alabama Claims and their Settlement* (1878).

DAVIS, Noah, b. N. H., 1818. He became a lawyer in western New York; justice of the supreme court; member of congress; and, 1873, was re-elected justice of the supreme court; became chief justice; retired, 1886.

DAVIS, Rebecca Harding, b. Washington, Pa., in 1831; married L. Clarke Davis of the Philadelphia *Inquirer*, 1863, when she removed to that city. She has been a frequent contributor to periodical literature and published many novels, among which are *Margaret Howth*, 1862; *Waiting for the Verdict*, 1867; *Dallas Galbraith*, 1867; *John Andross*, 1874; *A Law Unto Herself*, 1878; *Frances Waldeaux* 1897, etc.

DAVIS, Richard Harding, journalist and author; born in Philadelphia, April 18, 1864. He was educated at the Lehigh University, Pa., and the Johns Hopkins University. After serving as a reporter on the staff of the *Philadelphia Press* and the *New York Sun* (1888) he became in 1890 managing editor of *Harper's Weekly*, a position which he held only a short time. His principal books are *Gallegher* (1891); *Stories for Boys* (1891); *Van Bibber and Others* (1892); *The West from a Car Window* (1892); *The Rulers of the Mediterranean* (1893); *Our English Cousins* (1894); *The Exiles* (1894); *The Princess Aline* (1895); *About Paris* (1895), etc.

DAVISON, a co. in s.e. S. Dakota; formed 1873; drained by Dakota or James river; surface hilly; soil fertile; 435 sq. m. Pop. '90, 5449. Co. seat, Mitchell.

DA'VIS' STRAIT, so called from the navigator who discovered it, forms the southern part of that inlet of the Atlantic which washes the western coast of Greenland. It thus connects Baffin's bay, and also, in some sense, Hudson's strait, with the open ocean. At its narrowest point it measures 150 to 160 m. across.

DA'VIT in ship-building, is a piece of timber projecting over the bow or front-part of a vessel, and used as a crane for hoisting the anchor clear of her bow; two such pieces of timber or iron, on her side, or stern, are used for hoisting or lowering the boats. See Boat-lowering Apparatus.

DAVITT, Michael, founder of the Irish Land-League, b. Straide, co. Mayo, Ireland, 1846; of a family which, evicted from its farm, moved to Rochdale, England, while he was a child. He became a factory-hand and lost his right arm in the machinery. He educated himself. He was implicated in the Irish revolutionary attempt of 1867, sentenced to 15 years' penal servitude; released, in 1875, on "ticket-of-leave," and visited the U. S. on a lecturing tour. D. organized a land-league, 1880, Feb. 1, at his birthplace, whence the movement spread over Ireland. In 1881 he was re-arrested under the Coercion act and in 1882 was again released on "ticket-of-leave." He was elected to parliament several times and disqualified or unseated; was returned unopposed for Northeast Cork in 1893; and shortly afterward became a bankrupt and had to resign, and was elected for Kerry, East, in 1895. He was married to Miss Mary Yore, in Oakland, Cal., in 1886.

DAVORS, Jo (probably a fictitious name), author of a rare work called *The Secret of Angling*, quoted by Walton.

DAVOS, a valley in the Canton Grison, Switzerland, among the Rhætian Alps, about 20 m. long. It is famous as a resort for persons affected with diseases of the chest.

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DAVOUD PASHA, b. 1816; a Roman Catholic Armenian, minister of the Turkish empire. He was professor in the military college in Constantinople; became secretary of the embassy at Berlin; superintended the construction of telegraphs; and, in 1861, at the time of the trouble between the Druses and Maronites, was made governor of Lebanon; '68, minister of public works. His chief work is *History of the Seven Years' War*.

DAVOUT (not DAVOUST, as commonly written), LOUIS NICOLAS, a French marshal, was b. 10th May, 1770, at Annoux, in the old province of Burgundy; was educated along with Bonaparte at the military school of Brienne; and in 1788, became sub-lieut. in a cavalry regiment. During the revolutionary wars, he rose to the rank of gen. He accompanied Bonaparte to the east, where he mainly contributed to the victory at Aboukir, and otherwise distinguished himself both in upper and lower Egypt. On his return to France, he was named general of division in 1800, commander-in-chief of the consular grenadier guards in 1801, and marshal of the empire in 1804. In the campaigns of 1805, 1806, and 1807, he acted a brilliant part in the great victories obtained by the French at Ulm, Austerlitz, Jena, Auerstädt, Eylau, and Friedland. In reward of his bravery, Bonaparte created him duke of Auerstädt (July 2, 1808). On the renewal of the war with Austria in 1809, D.'s star was again in the ascendant, and he was created prince of Eckmühl for his services at the battle of Eckmühl. At Wagram, he performed prodigies of valor. Appointed governor of Poland, he ruled that country in a spirit of the harshest despotism, and provoked the reproaches of the emperor, but, nevertheless, did not change his system. In the Russian campaign of 1812, he gathered fresh laurels on the fields of Mohilow and Borodino. After the retreat from Moscow, D. became governor-general of the Hanse towns, and established himself at Hamburg, where he gallantly maintained himself till the first restoration of the Bourbons. On the return of Bonaparte from Elba, D. was appointed war-minister, and in this office showed a remarkable genius for the rapid organization of troops and supplies. After the battle of Waterloo, he received the command of the relics of the French army under the walls of Paris. He would have continued the contest, had he not been ordered by the provisional government in the capital to conclude a military convention with the allies. In 1819, he was made a peer of France. His death took place June 1, 1823. Firmness of character and dauntless courage were D.'s leading characteristics; but his military severities often went the length of harshness, and even cruelty, while his rapacity had in it something akin to barbarism.

DAVY, Sir HUMPHRY, one of the greatest chemists of his own or of any age, was b. on the 17th Dec., 1778, at Penzance, in Cornwall, where his father was a carver in wood. At the school of Truro, where he was educated until he was 15, he showed little relish for classical learning, but he was distinguished for a highly retentive memory and an early passion for poetry, which never forsook him. Another prominent trait of his character was equally early developed: as a child, he would angle even in the gutters of the streets; and only two years before his death, and after his health had given way, he published his interesting volume, *Salmonia, or Days of Fly-fishing*. Soon after leaving school, he became apprentice to a surgeon and apothecary in Penzance. He at the same time entered upon a course of study all but universal. "Speculations on religion and politics, on metaphysics and morals, are placed in his note-books in juxtaposition with stanzas of poetry and fragments of romance." A system of mathematical study, skeptical philosophy, Scotch metaphysics, and German transcendentalism, successively engaged his attention. The study of natural philosophy brought him nearer to that department which was to be his own; but it was not till he had reached his 19th year, that he entered seriously upon the study of chemistry. He now made the acquaintance of Dr. Beddoes, who had established a pneumatic institution at Clifton, and who took him as his assistant. Here D. carried on a course of experiments on the respiration of different gases, in which he had more than once nearly sacrificed his life. He thus discovered the singular exhilarating effect of nitrous oxide when breathed. The account which he published of his researches, established his reputation, and led to his appointment, at the age of 22, as lecturer to the royal institution of London. He delivered his first lecture in 1801; and his eloquence, and the novelty and variety of his experiments, soon attracted crowded and brilliant audiences. In 1803, he began researches connected with agriculture, on which he delivered a course of lectures. These were published in 1813, under the title of *Elements of Agricultural Chemistry*, and form an era in that science. The discoveries, however, on which D.'s fame as a chemist chiefly rests, took their origin in the views which he developed in 1806, in his Bakerian lecture, *On Some Chemical Agencies of Electricity*. This essay was universally regarded as one of the most valuable contributions ever made to chemical science, and obtained the prize of the French institute. Following out his principle, he was led to the grand discovery, that the alkalies and earths are compound substances, formed by oxygen united with metallic bases. It was potash that he first succeeded in decomposing, on the 8th Oct., 1807. When he first saw the globules of the new metal, *potassium*, his delight is said to have been so ecstatic that it required some time for him to compose himself to continue the experiment. He next decomposed soda and the alkaline earths, baryta, strontia, lime, and magnesia; and discovered the new metals, *sodium*, *barium*, *strontium*, *calcium*, and *magnesium*. With regard to the earths proper, he suc-

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ceeded in proving that they consist of bases united to oxygen. It was reserved for Wöhler and others to exhibit the bases by themselves.

In 1812, D. was knighted, married a lady of considerable wealth, and resigned the chemical chair of the royal institution. That he might investigate his new theory of volcanic action, he received permission from the French government—though the two countries were then at war—to visit the continent, and was received with the greatest distinction by the scientific men of France. On returning to England in 1815, he entered on the investigation of the nature of fire-damp, which is the cause of explosions in coal mines. This resulted in the invention of the safety-lamp (q.v.)—one of the most valuable presents ever made by science to humanity. Though the value of the invention was everywhere acknowledged, the only national reward was a baronetcy after a lapse of three years. This has been contrasted with the pension of £1200 a year bestowed by the same government on sir William Congreve, for the invention of his rocket. On the death of sir Joseph Banks, in 1820, sir Humphry D. was elected president of the royal society. His attention was shortly after called to the important object of preserving the copper sheathing of vessels from corrosion by the action of sea-water. This he effected by altering the electric condition of the copper by means of bands of zinc; but the bottoms of the vessels became so foul from the adhesion of weeds, shells, etc., that the plan had to be abandoned.

Early in 1825, sir Humphry D. had begun to complain of the loss of strength, and, in 1826, he had a paralytic attack affecting his right side. He made two journeys to the continent for the recovery of his health, and died at Geneva on the 29th May, 1829, at the early age of 51. The Genevese government evinced their respect by a public funeral. So widely spread was the reputation of sir Humphry D., that he was a member of almost all the scientific institutions in the world. Cuvier, in his *Eloge*, says: "Mr. Davy, not yet 52 years of age, occupied, in the opinion of all that could judge of such labors, the first rank among the chemists of this or of any other age." Besides the works already mentioned, and a great number of contributions to the Philosophical Transactions, sir Humphry D. published *Elements of Chemical Philosophy* (Lond. 1812); and *Consolations in Travel, or the Last Days of a Philosopher* (3d ed., Lond. 1831), appeared after his death. See *Memoirs of the Life of sir Humphry D.*, by his brother (Lond. 1836, 2 vols.); and *The Life of Sir Humphry D.*, by Dr. Paris (Lond. 1831).

DAVY JONES'S LOCKER, a common phrase applied to the ocean as the grave of men drowned at sea. Davy Jones is a sailor's familiar name for a malignant sea-spirit, or for the devil. Some connect the name Davy with *devil*, German *teufel*, while another explanation of the name, Davy Jones, makes it a compound from *duffy*, a West Indian negro spirit name, and the Scriptural *Jonah*, in jocular allusion to his unusual adventures.

DAVY'S SAFETY-LAMP. See SAFETY-LAMP.

DAW. See JACKDAW.

DAWAL'LA, *Hypophthalmus dawalla*, a fish of the family *Siluridæ*, found in the rivers of Guiana, and highly estimated for the delicacy of its flesh. It is sometimes 2½ ft. long, and has a snout somewhat like that of a pike, but the mouth is furnished only with very minute teeth. The skin is destitute of scales, and the colors have that brightness so often seen in tropical fishes, green, brown, and carmine. The D. has become shy in the waters of the more populous and long-settled parts of Guiana, although easily captured in more remote regions.

DAWES, HENRY LAURENS, b. Mass., 1816; graduated at Yale, and became an editor. He resides in Pittsfield. He has been in both houses of the state legislature, district attorney, and member of congress. In the house of representatives he was chairman of the committee on appropriations and the committee of ways and means. He was made senator in 1875, re-elected 1881 and 1887, declined a fourth term in 1893, was elected professor of United States History since the civil war in Dartmouth college, and was chairman of a commission to the five civilized tribes of Indians in 1895–7.

DAWISON, BOGUMIL, 1818–72; a native of Poland, of Jewish parentage, who, through his own talents and exertions, gained such eminence on the stage as to be deemed by many the greatest actor of his time. In 1866, he came to America, where he had great success through two years. Soon after his return he became insane, and never recovered.

DAWK, or DAK, a method of traveling in India which consists in posting by palanquin from station to station, or for any distance. The traveler must first purchase a strong palanquin, which he can have for from 40 to 100 rupees (£4 to £10), but which he can always dispose of when his journey has been completed, and generally at a profit. His clothes, together with whatever articles he may not immediately need, are carried in tin-boxes or wicker-baskets called *pettarahs*, by separate bearers, who precede or accompany the palanquin; whatever he considers necessary, however, he keeps beside himself inside. At all the stages, which are from 9 to 11 m. apart, there are relays of bearers, previously provided by the postmaster, the usual number for one palanquin being eleven.

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DAWN. See TWILIGHT.

DAWSON, a co. in n. Georgia, drained by the Etowah; 192 sq.m.; pop. '90, 5612 with colored. It is hilly and fertile, producing corn and cotton. Co. seat, Dawsonville.

DAWSON, a co. in e. Montana, bordering on N. Dakota and British America, intersected by the Missouri; about 26,680 sq.m.; pop. '90 2056. Co. seat, Glendive.

DAWSON, a co. in central Nebraska, on the Platte river, intersected by the Union Pacific railroad; 1028 sq. m.; pop. '90, 10,129. Co. seat, Lexington.

DAWSON, a co. in n.w. Texas; 900 sq. m. Unorganized. Pop. '90, 29.

DAWSON, Sir JOHN WILLIAM, LL.D., Canadian geologist and naturalist, was born at Pictou, Nova Scotia, in 1820; studied in the University of Edinburgh, and returning home, devoted himself to the study of the natural history and geology of Nova Scotia and New Brunswick, the results of which were embodied in *Acadian Geology* (3d ed., 1880). He aided Sir Charles Lyell in exploring Nova Scotia in 1841 and 1852. In 1850 he became superintendent of education in Nova Scotia, and in 1855, principal of McGill College, at Montreal, afterwards becoming vice-chancellor. His *Devonian and Carboniferous Flora of Eastern North America* made known his discovery of the Eozoön Canadense of the Laurentian limestone, believed to be the oldest known form of animal life. In 1882 he received the Lyell medal of the London Geological Society; in 1884 was knighted. He was president of the American Association for the Advancement of Science in 1882, and of the Birmingham meeting of the British Association in 1885. He is a LL.D. of Edinburgh and honorary member of many foreign and American societies. Among his works, several of which combat the Darwinian theory of the origin of species, are: *Acadia* (1851); *The Story of the Earth and Man* (1872); *The Dawn of Life* (1875); *The Origin of the World* (1877); *The Change of Life in Geological Time* (1880); *Fancies in Science* (1882); *Egypt and Syria* (1885); *Science in Bible Lands* (1888); *Modern Ideas of Evolution* (1890); *Some Salient Points in the Science of the Earth* and *The Meeting Place of Geology and History* (1894); *Eden Lost and Won* (1897), etc.

DAX, a t. of France, in the department of Landes, pleasantly situated on the left bank of the Adour, 20 m. n.e. of Bayonne. Among its principal buildings are the high church, once a cathedral, and the bishop's palace. It is an intermediate depot for goods forwarded to Spain, and has some manufactures of earthenware, wine, and brandy; but it is chiefly remarkable for its hot saline springs, the temperature of which at the source is 158° F. The water, which is medicinal and nearly tasteless, was used for bathing purposes by the Romans. Pop. '91, 8716.

DAY (probably allied to the Lat. *dies*, day, *divum*, the sky, from the root *div*, to shine) originally meant the space of time during which it is light, in opposition to the space of darkness or night; it now more usually denotes a complete alternation of light and darkness. It is the earth's rotation that causes the vicissitude of day and night. The earth being a globe, only one half of it can be in the sun's light at once; to that half it is day, while the other half is in its own shadow, or in night. But by the earth's rotation, the several portions of the surface have each their turn of light and of darkness. This happens because the position of the earth is such that the equator is on the whole presented towards the sun; had either pole been towards the sun, that hemisphere would have revolved in continual light, the other in continual darkness.

One complete rotation of the earth does not make a day, in the usual sense. If the time is noted when a particular fixed star is exactly s. or on the meridian, when the same star comes again to the meridian the next day, the earth has made exactly one rotation, and the time that has elapsed is called a *sidereal day*. This portion of time is always of the same length; for the motion of the earth on its axis is strictly uniform, and is, in fact, the only strictly uniform motion that nature presents us with. Sidereal time, or star-time, from its unvarying uniformity, is much used by astronomers. But the passage of a star across the meridian is not a conspicuous enough event for regulating the movements of men in general. It is not a complete rotation of the earth, but a complete alternation of light and darkness that constitutes their day. This, which is called the *civil* or the *solar* day, is measured between two meridian passages of the sun, and is about four minutes longer than the sidereal day. The cause of the greater length is this: When the earth has made one complete turn, so as to bring the meridian of the place to the same position among the fixed stars as when it was noon the day before, the sun has in the meantime (apparently) moved eastward nearly one degree among the stars, and it takes the earth about four minutes more move round so as to overtake him. If this eastward motion of the sun were uniform, the length of the solar day would be as simple and as easily determined as that of the sidereal. But the ecliptic or sun's path crosses the earth's equator, and is therefore more oblique to the direction of the earth's rotation at one time than another; and besides, as the earth moves in her orbit with varying speed, the rate of the sun's apparent motion in the ecliptic, which is caused by that of the earth, must also vary. The consequence is, that the length of the solar day is constantly fluctuating; and to get a fixed measure of solar time, astronomers have to imagine a sun moving uniformly in the celestial equator, and completing its circuit in the same time as the real sun. The time marked by this imaginary sun is called *mean solar time;* when the imaginary sun is on the meridian, it is *mean noon;* when the real sun is on the meridian, it is *apparent* noon. It is obvious that a sun-dial must show apparent time, while clocks and watches keep mean time. Only in four days of the year do these two kinds of time

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coincide. In the intervals, the sun is always either too fast or too slow; and the difference is called *the equation of time*, because, when added to or substracted from apparent time, it makes it equal to mean time. The mean solar day is divided into twenty-four hours, the hours into minutes and seconds. A sidereal day, we have seen, is shorter; its exact length is 23 hours, 56 minutes, 4 seconds of mean solar or common time. Astronomers divide the sidereal day also into twenty-four hours, which are of course shorter than common hours. In the course of a civil year of 365 days, the earth turns on its axis 366 times, or there are 366 sidereal days. Astronomers reckon the day as beginning at noon, and count the hours from 1 to 24. The civil day begins at midnight, and the hours are counted in two divisions of twelve each. The ecclesiastical day was reckoned from sunset to sunset. See INTERNATIONAL DATE LINE: DAY OF THE WEEK.

A day, in law, includes the whole twenty-four hours, without any reference to the season of the year, or the amount of light or darkness. Where there is no qualifying stipulation, therefore, the obligation to pay on a certain day is discharged, if the money be paid before twelve o'clock at night, or the commencement of the following day. On the same principle, if anything is to be done within a certain time from or after the doing of a certain other thing, the day on which the first act or occurrence takes place is excluded. If A binds himself to pay money ten days after B's death, and B dies on the 1st, the money will not be be due till the night of the 11th at twelve o'clock. Where it is not absolutely necessary, for the purposes of justice, the law excludes fractional portions of time; thus, half a year consists of 182 days, and a quarter of a year of 91.

A *lawful day* is a day on which there is no legal impediment to the execution of a writ—i.e., all days except Sundays and fast-days appointed by government. Criminal warrants are an exception to this rule, and may be both granted and executed on Sundays and fast days. By 29 Car. II. c. 7, all contracts made by persons in their ordinary calling on a Sunday are void. The exceptions to this rule will be explained under LORD'S DAY. In England, Christmas-day, Good Friday, and Easter-day generally stand on the same footing with days appointed by royal proclamation for public fasting and humiliation; but in Scotland, there is no exception made in favor of any of the feast or fast days of the church.

Days of Grace. The time at which a bill is actually *due*, or *at maturity*, is in general three days after the time expressed on the face of it. The three additional days which are generally allowed by the custom of merchants, and which the laws of the United Kingdom recognize and protect, are called days of grace. If the third day of grace fall on a Sunday, the bill is payable the day before. If it fall on any of the bank holidays, the bill is payable the day after. See BILL.

DAY, a co. in n. eastern S. Dakota, formed 1879; 1080 sq.m.; pop. '90, 9168. Co. seat, Webster.

DAY, GEORGE EDWARD, D.D., b. Mass., 1815; graduate of Yale, and the Yale theological seminary, where he was assistant instructor in sacred literature. Afterwards he was in the ministry; from 1851 to 1866, occupied the chair of biblical literature in Lane theological seminary, and afterwards that of the Hebrew language and biblical theology in the divinity school of Yale college. He has published a number of translated and original works.

DAY, JEREMIAH, D.D., LL.D., 1773–1867; b. Conn.; graduate of Yale · professor of mathematics and natural philosophy; and president of the college from 1817 to 1846. He published *An Introduction to Algebra; Navigation and Surveying;* etc.

DAY, OR DAYE, STEPHEN, 1610–68; b. England; the first printer in the New England colonies. He came over in 1638, and began printing at Cambridge the next year, producing first *The Freeman's Oath*, but what freemen were meant does not appear. Then came an almanac, and afterwards the Psalms in the rude meter of the age. He printed also a catechism, *The Body of Liberties*, and many of the laws enacted.

DAY, THOMAS, a political writer and poet, was born in London, June 22, 1748, and studied at Oxford. The American war of independence, with which he strongly sympathized, seems to have roused his poetical energies. In 1773, he published *The Dying Negro;* in 1776, *The Devoted Legions;* and in 1777, *The Desolation of America.* But he is chiefly remarkable as the author of the famous *History of Sandford and Merton*, as also the *History of Little Jack.* He was killed by being thrown from a horse, 28th Sept., 1789.

DAYAKS. See BORNEO, and BROOKE, Sir JAMES.

DAY OR DAYS. DARK DAY in New England; see DARK DAY.—DECORATION DAY, the 30th of May, when in the cities and large towns of northern states there are processions to the various cemeteries, and the decorating of the graves of union soldiers with flowers. There is a similar custom in some of the southern states, formerly somewhat earlier in the season.—ELECTION DAY, in nearly all the states of the union, comes on the Tuesday following the first Monday in Nov.—mostly a legal holiday.—EMANCIPATION DAY (in the British colonies), Aug. 1, 1834, when 770,280 slaves became free. The day is still celebrated by colored people in the West Indies and the United States.—EMANCIPATION DAY (in the United States), Jan. 1, 1863, when President Lincoln proclaimed freedom to nearly 4,000,000 of slaves.—EVACUATION DAY, Nov. 25 (local to New York). The British troops held the city during the revolutionary war, but on the conclusion of peace were withdrawn, Nov. 25, 1783. The annual celebration was long kept up with

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great spirit, but has now fallen out of use.—GENERAL TRAINING DAY, once important as the annual turnout and drill of the rural militia, and kept as high holiday. It was usually in the latter part of the summer. In recent times the more complete organization of the militia has had the effect of doing away with general town and county muster.—HUNDRED DAYS, the period betwen Mar. 20, 1815, when Napoleon left Elba, and June 22 of the same year, when he was forced to abdicate, and was sent a prisoner to St. Helena.—LUCKY DAYS, certain recurring periods which people fancy are peculiarly fortunate for themselves; especially those which may be called "recurrent" days, as in the case of Thomas à Becket, who was born, baptized, fled to France, returned to England, was assassinated, and 700 years later had a church dedicated to him by cardinal Manning, each event occurring on Tuesday. Cromwell's peculiar day was the 13th of Sept., on which day in successive years he was born, won the battle of Worcester, and died. Harold, last of the Saxon kings, was born, lost his kingdom, and died on Oct. 14. Napoleon's day was the 2d of the month, on which date he was made consul, crowned, won at Austerlitz, and married Maria Louisa. The last Napoleon effected the *coup d'état* Dec. 2, was made emperor the same day, began the war on Germany Aug. 2, and surrendered his sword Sept. 2. Some of the greatest rulers of France of the house of Bourbon have been curiously connected with the 14th of the month, and also with 14 as a simple number. On May 14, 1026, the first king of France named Henry was consecrated, and on May 14, 1610, the last Henry was assassinated. Fourteen letters enter into the name of Henri de Bourbon, who was the 14th king bearing the titles of France and Navarre. Dec. 14, 1553, that is, 14 centuries, 14 decades, and 14 years after the birth of Christ, Henry IV. was born; the ciphers of the date 1553, when added together, give the number 14. May 14, 1552, was the date of the birth of Marguerite de Valois, first wife of Henry IV. May 14, 1588, the Parisians revolted against Henry III., at the instigation of the duke of Guise. Mar. 14, 1590, Henry IV. gained the battle of Ivry. May 14, 1590, Henry was repulsed from the Faubourgs of Paris. Nov. 14, 1590, the Sixteen took an oath to die rather than serve Henry. Nov. 14, 1592, the parliament registered the papal bull giving power to the legate to nominate a king to the exclusion of Henry. Dec. 14, 1599, the duke of Savoy was reconciled to Henry IV. Sept. 14, 1606, the dauphin, afterwards Louis XIII., was baptized. May 14, 1610, the king was assassinated by Ravaillac. Henry IV. lived four times 14 years, 14 weeks, and four times 14 days. May 14, 1643, died Louis XIII., son of Henry IV.; not only on the same day of the same month as his father, but the date, 1643, when its ciphers are added together, gives the number 14, just as the ciphers of the date of the birth of his father gave 14. Louis XIV. mounted the throne in 1643; 1, 6, 4, 3 = 14. He died in the year 1715; 1, 7, 1, 5 = 14. He lived 77 years; 7 and 7 = 14.—RED LETTER DAY is so called from the practice of early printers of almanacs denoting holidays and fasts and festivals by red ink, all others being in black. THANKSGIVING DAY, at first a purely New England institution, within recent years has become national. It is supposed to have been in some degree a successor of the Hebrew feast of the tabernacles. Beginning almost with the beginning of the pilgrim colony, amid privations which seemed to offer small material for thankfulness, it rapidly spread over all New England, and has at last established itself in all the states, through the recommendation of governors and of the president in annual proclamations. By usage, the date appointed is the Thursday last in November.—UNLUCKY DAYS vary with different people. The most noted among nations speaking English is Friday, as the day on which the Saviour was crucified, to which day, by common consent, until recently, were assigned all capital executions of the law on criminals. It is not many years since it was almost impossible to induce sailors to start on long voyages on this day; but the history of the great discoverer Columbus gives a remarkable refutation of this superstition. On Friday, Aug. 21, 1492, he sailed on his voyage of discovery. On Friday, Oct. 12, he first discovered land. On Friday, Jan. 4, 1493, he sailed on his return to Spain, which if he had not reached in safety, the happy discovery might never have been known. On Friday, Mar. 15, he arrived at Palos. On Friday, Nov. 22, he arrived at Hispaniola, on his second voyage to America. On Friday, June 13, 1494, he discovered the continent of America, though unknown as such to him. Among the events of success and importance occurring on Friday, are the founding of St. Augustine, Fla., the oldest city in the United States; the arrival of the Mayflower (old style date) at the harbor of Provincetown, and the signing of the compact by the pilgrims on the same day; their landing on Plymouth rock (new style); George Washington born; Bunker hill seized and fortified; British surrender at Saratoga; Arnold's treason discovered; and the final surrender of the British forces at Yorktown. In the war with Mexico, the battle of Palo Alto began on Friday, and the treaty of peace between the two countries was ratified on Friday. In the same year, the question of our northwestern boundary, with its menace of war, was settled by a treaty signed on Friday. In the war of the secession the main events occurring on Friday were: Fort Sumter captured by the confederates; Port Royal forts taken by the unionists; close of the battle of Pea Ridge; slavery abolished in the district of Columbia; Fort Pulaski taken by unionists; Memphis taken by unionists; Fredericksburg bombarded; battle of Gettysburg ended; Vicksburg bombarded; President Lincoln offered amnesty to all except the chief leaders of the civil war; Lee defeated at Five Forks (three days' fighting); the

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union flag restored on Fort Sumter, and the assassination of Lincoln—both on Good Friday, April 14, 1865. See ARBOR DAY, LABOR DAY, HOLIDAYS, LEGAL.

DAY OF THE WEEK. To find the day of the week for any date, past or future, there are several methods, but the simplest and most easily understood is as follows: First, there is a "constant" for the *style*—for new style it is 6; for old style, 4. (In English chronology, new style begins 1752, Sept. 15.) Then there is a "constant" for each month: in new style, Jan., 1; Feb., 4; Mar., 4; April, 0; May, 2; June, 5; July, 0; Aug., 3; Sept., 6; Oct., 1; Nov., 4; Dec., 6; (on leap years the constants for Jan. and Feb. are one less, that is, for Jan., 0; for Feb., 3). Now (for new style), multiply the number representing the century by 5, and add one fourth to the product (omitting fractions). For instance: in 1880 the century number is 18, which multiplied by 5 makes 90, and one fourth of 18 (omitting fractions) is 4; hence the product is 94. Next add the number of the odd years (besides the century number), and add one fourth (omitting fractions) to their total. Next add the day of the month. Then add all these figures together, and finally, divide the sum by 7; the remainder will show the day of the week; remainder of 1 showing the first day of the week, or Sunday; remainder of 2 showing the second day of the week, or Monday, etc.; no remainder showing the 7th day of the week, or Saturday. Illustration: What is the day of the week for Jan. 1, 1881?

Constant for new style	6	Odd years	81
Constant for the month (Jan.)	1	Add one fourth of 81	20
Century (18) multiplied by 5	90	Day of the month	1
Add one fourth of 18	4		
Total			203

Divide 203 by 7, and there is no remainder; so the year 1881 must begin on the 7th day of the week, or Saturday.

For old style the constant is 4, and the number of the century is multiplied by 6, without addition of the one fourth. The constants for months are the same as in new style, and one fourth (omitting fractions) is added to the odd years. Example for old style: On what day of the week did Columbus land on his voyage of discovery (Oct. 12, 1492)?

Constant for old style	4	Odd years (92) one fourth added	115
Constant for Oct	1	Day of the month	12
Century (14) multiplied by 6	84		
Total			216

Divide by 7, and the remainder is 6—the 6th day of the week, or Friday. For leap years, care must be taken in both old and new style to reduce the constants for Jan. and Feb. by one, for each of those two months.

DAY-FLY. See EPHEMERA.

DAY-LILY, *Hemerocallis*, a genus of plants of the natural order *liliaceæ*, having a perianth with bell-shaped limb, and sub-cylindrical tube, and globose seeds with soft *testa*. Several species are cultivated in our flower-gardens, especially the fragrant yellow day-lily (*H. flava*), a native of Hungary, Siberia, and the n. of China. It has also been recommended to farmers as affording a supply of a most acceptable green-food to cattle. But *H. fulva*, a native of the Levant, produces more abundant foliage, and cattle are equally fond of it. Both species are fibrous-rooted perennials with linear leaves.

DAYSMAN, a name formerly given in England (and still in use in some of the northern counties) to an arbitrator, umpire, or elected judge. It has its origin in the judicial language of the middle ages, when the word *day* was specially applied to the day appointed for hearing a cause, or for the meeting of an assembly. A D. was thus a judge appointed to decide between parties at a judicial hearing. The word occurs in Scripture, where Job sorrowfully says, in reference to his relation to God: "Neither is there any daysman betwixt us, that might lay his hand upon us both" (Job ix. 33).

DAYTON, city and co. seat of Montgomery co., Ohio, on the e. bank of the Great Miami river at its junction with Mad river; lat. 39° 44′ n.; long. 84° 11′ w.; 67 m. w. by s. of Columbus, and 60 m. n.n.e. of Cincinnati. The Miami canal passes through, and the Erie, the Dayton and Union, Cincinnati, Hamilton and Dayton, and Pittsburg, Cincinnati, Chicago, and St. Louis are among its many railroads. D. was settled in 1796 and was chartered as a city in 1841. The Miami valley, in which it is situated, is one of the most fruitful sections of the state. The city is regularly laid out with wide streets, is approached by 26 macadamized turnpikes, and is noted for the costliness of its public buildings, among which are a court-house, modeled after the Parthenon, an annex of greater dimensions, a stone jail, and several large market houses. There is a fine soldiers' monument. Manufacturing is facilitated by two hydraulic canals, which are crossed by a number of bridges. The capital invested, 1890, in 937 plants was $13,469,964; the value of products, $22,446,572. Among articles are railroad cars, stoves, engines,

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hollow ware, farm tools, liquors, cotton and woolen goods, oil, flour, glucose, paper, and shirts. The marble and limestone quarries in the vicinity employ a large number of men. There are national and savings banks, several insurance companies, more than 50 churches, English training school for boys and girls, Notre Dame academy, Steele high school, many public and parochial schools, and a large number of daily, weekly, monthly, and quarterly periodicals, Cooper seminary for girls (Presb.), St. Mary's institute for boys (R. C.), a county orphan asylum, St. Mary's convent, Dayton normal school, a public library. In the suburbs is a state asylum for the insane, and 4 m. from the city is the central national home for disabled sailors and soldiers, having 40 large buildings in extensive grounds, a hospital, a music hall, and a large library. Pop. '90, 61,220.

DAYTON, ELIAS, 1737–1807; b. N. J. He was among the British in the expedition against Canada. When the revolution broke out, he became one of a committee of safety, served as colonel in the army, was appointed commander of a brigade, and remained in active service through the war. After peace he was in the state legislature, and in congress. He had intimate friendship with Washington.

DAYTON, JONATHAN, LL.D., 1760–1824; b. N. J., son of Elias; a graduate of the college of New Jersey. He was a member of the legislature and speaker of the assembly; delegate to the convention to frame the federal constitution; representative in congress three terms, being speaker of the house during the last two terms; and in 1799, he was chosen U. S. senator.

DAYTON, WILLIAM LEWIS, LL.D., 1807–64; b. N. J., nephew of Jonathan; a graduate of the college of New Jersey, and a lawyer. He was in the state senate, and in 1842, a vacancy occurring in the U. S. senate, he was called to fill it. He was re-elected and took an active part in the leading questions of the day. In 1856, he was the republican candidate for vice-president. In 1857, he was attorney-general of New Jersey, and in 1861 was sent as minister to France, where he died.

D'AZA'RA, Don FELIX, a very eminent naturalist, was b. at Barbunales, in Aragon, 8th May, 1746, was educated at the university of Huesca, obtained a commission in the Spanish army, was severely wounded in the attack upon Algiers, and in 1781, was appointed one of the commissioners for fixing the boundaries of the Spanish and Portuguese possessions in South America. He proceeded immediately to that country, and did not return to Spain till 1801, encountering many difficulties in the discharge of his duties, in which he showed the greatest faithfulness and perseverance. He devoted himself also to the investigation of the geography, ethnology, and natural history of the regions in which he spent so many years, and published an account of his travels, and an important work on quadrupeds and birds, under the modest title of *Notes on the Natural History of Paraguay and La Plata* (Madrid, 1802, *et seq.*).—D.'s elder brother was eminent as a diplomatist.

DEACONS, literally *servants*, meant, in apostolic times, properly those officers of a congregation or church that had the charge of collecting and distributing the alms, and of taking care of the poor and the sick. The office, therefore, was not a clerical one, though the term deacon or servant may have been at times applied to teachers as *minister* was, which has the same meaning. The limitations of the office of deacon to the functions above specified, continued to be recognized as late as the council of Trullanam, 692. The church of Jerusalem chose at first seven deacons, individuals of whom, no doubt, as Philip, also taught and baptized, but only because they were evangelists as well as deacons. The number seven continued to be adhered to in all churches. During the 2d and 3d centuries, the duties falling to the deacons had considerably increased; and since as confidential attendants and helpers of the bishops, they had risen into consequence, it became necessary to divide the various functions among an archdeacon, deacons, and subdeacons. Deacons might now dispense the bread and wine at the communion, but not consecrate them. They had to receive the offerings and presents for the bishop, to keep the sacred vessels, to chant the introductory formulas of public worship, and to take the oversight of the morals of the congregation; and they were allowed, in many cases, with the leave of the bishop, to preach and baptize, and receive penitents into the communion of the church. At an early period, the offices of archdeacon and deacon were considered to belong to the higher orders of consecration (*ordines majores*); this was not the case with that of subdeacon till after the 12th century. At the consecration of a deacon, the sacred vessels are handed to him as symbols of his office. The peculiar robes are the dalmatica and the stole. In Protestant churches, the position of deacons varies. Among Presbyterians, their place is usually supplied by the elders; but in some Presbyterian churches (e.g., the Free church of Scotland), the offices of elder and deacon are kept distinct. In the church of England, a deacon is a clergyman receiving a special form of ordination, but differing in effect from a regular priest only from not being allowed to consecrate the elements at the communion, or pronounce the absolution or benediction. For this, as well as for holding any benefice or church-preferment, priest's orders are necessary. The office is of little importance, except as affording an interval of probation before admission to priest's orders. Before a person can be appointed deacon in

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the English church, he must have reached the age of 23, and he usually remains in this office one year at least. In Congl. churches deacons are assistants in pastoral work.

DEACONESSES (*ancillæ, ministræ, viduæ, virgines, episcopæ, presbyteræ*), female ministers or servants of the church or Christian society in the time of the apostles (Rom. xvi. 1). They co-operated with the deacons, showed the women their place in the church-assemblies, assisted at the baptism of persons of their own sex, instructed those who were about to be baptized as to the answers they should give to the baptismal questions, arranged the *agapæ* or love-feasts, and took care of the sick. In the 3d c., it seems to have been also part of their duty to visit all Christian females who were suffering imprisonment, and to be hospitable to such as had come from afar. In very early times, they were consecrated to their office by ordination in the same manner as other ecclesiastical or spiritual personages; later, however, they were inducted into their office by prayer without the imposition of hands. Until the 4th c., the D. had to be either maidens or widows who had been only once married, and 60 years of age; but after the council of Chalcedon, the age was fixed at 40. Their assistants were called *sub-deaconesses*. After the 6th c., in the Latin church, and after the 12th c., in the Greek church, the office of deaconess was discontinued; but the former has retained the name. In monasteries, for example, the nuns who have the care of the altar are called deaconesses. In the Reformed church of the Netherlands, also, those elderly females are called D. who take care of lying-in women and of the poor. The advantages resulting to a Christian community from such an order are too obvious to require exposition. It has been a serious misfortune to the church at large, that the office has been allowed to fall into disuse; and the wide-spread institution at the present day in the churches of Great Britain and America of ladies' district-visiting societies, Dorcas societies, etc., satisfactorily shows the necessity of practically supplying, to some extent at least, the want of this primitive office. In the Reformed churches of the Continent there are deaconesses who nurse the sick and tend the poor. The first deaconesses' house at Kaiserwerth on the Rhine, near Düsseldorf, was founded by Theodor Fliedner (q.v.), in 1836, and now scattered over the Protestant world there are upwards of sixty similar institutions, with fully 6000 sisters. The Church of Scotland adopted the office of deaconess in 1887–88. The Diocesan Deaconess Institution, in London, was established in 1861, but sisterhoods (q.v.) have taken deeper root in the Anglican communion. In the United States a branch of the Kaiserwerth institution was established at Pittsburg, Pa., in 1849. In the Protestant Episcopal church the first order—omitting the sisterhood to the Holy Communion, formed in 1845—was that established in 1855 in connection with St. Andrew's parish, Baltimore, Md. The office of deaconess was introduced into the Methodist Episcopal church in 1888, and there are now a number of homes in connection with that denomination, whose inmates, however, take no vows and may leave at any time. The General Assembly of the Presbyterian church took similar steps in 1889. The English Puritans of the 16th century recognized deaconesses. About 1850 a few Congregational churches in the United States revived the office, and it is now not uncommon in the denomination, though the term "church visitor" is often applied to persons performing the same duties. See Howson, *Diaconate of Women in the Anglican Church* (1886); Wheeler, *Deaconesses, Ancient and Modern* (N. Y., 1889).

DEACON OF A TRADE. See DEAN OF GUILD.

DEAD, in seafaring language, is very frequently employed as part of a designation or phrase having, in general, a meaning somewhat opposite to that of *active, effective,* or *real.* The chief of such phrases are the following: *D. eyes* are circular, flattish wooden blocks, which, with other apparatus, form a purchase or tackle for extending the standing rigging and other purposes. *D. flat* is the name for one of the midship-timbers. *D. lights* are strong wooden shutters to close cabin-windows: on the approach of a storm, it is customary to take out the glass-windows, as being too fragile, and replace them with D. lights. *D. rising* is a name for that part of a ship's bottom where the floor-timbers terminate, and the lower futtocks or foot-hooks begin. *D. ropes* are such as do not run in blocks. *D. wood* consists of blocks of timber laid upon the keel, especially fore and aft; it is piled up, and fastened to the keel with iron spike-nails; the chief object is to give solidity and strength to the ends of the ship. To these may be added *D. wind,* a seaman's designation for a wind blowing directly against a ship's course.

DEAD, BOOK OF THE. The English name given to the Per-em-Hru, the great funerary work of the Egyptians. It was a collection of prayers and texts to assist the soul through Amenti (Hades) and to this end portions of it were put into the tomb with the mummy. Its age is unknown, but there is evidence sufficient to prove that the Egyptians themselves considered it of great antiquity. Naville regards it as antedating the worship of Amen. Its text may be assigned to four distinct periods: 1. That of the ancient and middle empire, uncollected, little known, and hieroglyphic. 2. That of the 17th to 20th dynasty, also hieroglyphic. 3. That of the 20th to the 26th dynasty, hieratic. 4. That of the Laïte and Ptolemaic periods both hieratic and hieroglyphic. It was during the Laïte renaissance that one of the Psammetici did for the then extant fragments of the Book of the Dead what Pisistratus did for the Homeric poems. The copyists used this revised text as a basis for their work for many years, and plied a busy trade in copies made to order and copies made for sale. As a result, errors and interpolations rapidly increased until the text became hopelessly corrupt. Thus no

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complete and perfect text has come down to us, but in 1886 Edouard Naville after ten years of incessant collating, collecting, and selecting from the papyri still existing, completed and published an "ideal copy" of the text of the second period entitled *Das Aegyptischen Todtenbuch der XVIII. bis XX. Dynastie*

DEAD, BURNING OF THE. See BURIAL: CREMATION.

DEAD, JUDGMENT OF THE (in ancient Egypt). The papyrus rolls found with the Egyptian mummies contain a description of the fate of the departed subsequent to their death. Even in the least complete specimens, the most important scene is seldom wanting—that, namely, in which the dead is led by the hand of Ma, the goddess of truth and justice, into the judgment-hall of the nether world, before Osiris, the judge of the dead. The god's throne faces the entrance. In the middle of the hall stands a huge balance, with an ostrich feather, the symbol of truth, in one scale, and a vessel in the form of a human heart in the other. A female hippopotamus appears as accuser. Above sit 42 gods, each of whom specially presides over one of the 42 sins from which the deceased has to clear himself. The gods Horus and Anubis attend to the balance, while the ibis-headed Thoth-Hermes, the justifier, writes down the result, which is naturally assumed to be favorable. Such is the judgment of the dead in the Egyptian Hades. But, according to Diodorus, a human judgment had already been passed upon the departed previous to burial. Before the sarcophagus was launched upon the holy lake over which it was to be ferried by Charon, the friends and relatives of the dead, together with 42 judges, assembled on the shore. Each was permitted to bring an accusation against him, and if it were proved, the solemnities of burial were withheld. A false accuser, however, was severely punished. Even unjust and unpopular monarchs were often deprived of sepulture by this process.

DEAD, PRAYING FOR THE. See PRAYER.

DEAD COLOR, in painting, any color that has no gloss, or reflecting quality.

DEADHEAD, the superfluous length which is given to a gun in the casting, so that dross may be disposed of while the gun is left in a perfect state, which is accomplished by sawing off the extra length.

DEAD-LETTER OFFICE, a division in the U. S. post-office department at Washington for the reception, care, and disposition of letters and packages (except newspapers) that are uncalled for or cannot be delivered to the parties to whom they are directed at the various post-offices of the country. A statement of the business of this office for the year 1879 will give an idea of its importance and efficiency: The whole number of dead letters and packages received and disposed of during the year was 2,996,513, a decrease of 190,292 from receipts of the previous year. The fact that while there has been an increased number of letters mailed annually in this country, a reduced number has been sent to the department as dead, presents an anomaly which can be explained only upon the theory of increasing efficiency of the delivery service, and the growing popularity of the return-request system. The extent of the latter will be illustrated by the statement that of the 533,934 letters mailed in a single day at Baltimore, Boston, New York, and Philadelphia, 287,835 bore upon the envelope some clew by which they could be restored to the writer if undelivered, without the intervention of the dead-letter office. The present system of treating insufficient prepaid letters is the most satisfactory of any which has yet been devised for disposing of that unfortunate class of correspondence. It is as follows: Those that bear a name and address, or a business card, post-office box, or other designation by which the writer can be identified, are immediately restored to the owner, or his attention invited to the deficiency of postage, by the postmaster at the mailing office. Of the balance, all "local" or "drop" letters are delivered by the postmasters to the persons addressed, upon payment by them of the necessary postage, after due notice of the fact and cause of detention. The remainder are sent to the dead-letter office, and are at once examined by an expert, who, taking into consideration the places of origin and destination of each letter, determines whether it can be returned to the writer in less time than would be required to collect the postage from the addressee and forward the letter to destination. And each letter is then treated in the way decided to be the quicker. Whenever a doubt exists, or where the difference is very small, the postage is collected and the letter forwarded, thus preserving the seal intact. The whole number of dead letters received and disposed of in 1884 was 4,751,872. The amount realized by the sale of articles for which no owner can be found is deposited in the U. S. treasury. The proceeds of the sale in 1884 were $1915.43. The money separated from dead letters which cannot be restored to the sender is also placed in the treasury, and the amount thus deposited in 1884 was $7239.47 Of the letters opened, 17,387 contained $33,770.17 in money; 20,204 contained drafts, checks, etc., to the value of $1,576,948.13; 95,191 contained merchandise, books, etc.; 84,397 contained receipts, paid notes, etc.; 38,348 contained photographs; 84,088 postage stamps, and 3,837,655 nothing of value. The late postmaster-general Maynard ordered that such useful printed matter as had previously been sold for waste paper should be distributed among the inmates of the various hospitals, asylums, and other charitable and reformatory institutions in the District of Columbia. The practice still prevails, and 23,152 magazines, pamphlets, illustrated papers, Christmas cards, valentines, etc., were disposed of in that way.

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Letters held for postage numbered: Foreign address, 13,959; domestic address, 117,070; misdirected, 366,524; blank, 14,134; unmailable, containing lottery tickets, etc., 1797; addressed to hotels, 112,648; fictitious addresses, 24,383.

Packages held for postage were 9774; misdirected, 10,596; blank, 13,389; unmailable, 7775; excess of weight or measure, 1144.

Foreign letters and packages received and disposed of by the dead-letter office numbered 477,198; of these, 456,630 were returned to the country of origin; 591 were delivered to addressees; misdirected letters to the number of 12,070 were forwarded to the correct address.

The number of letters and packages originating in the U. S. and returned by foreign countries as undeliverable was 210,436. The letters, newspapers, parcels, etc., received in the returned letter offices of Great Britain, 1887–88, numbered 13,436,600.

DEADLY NIGHTSHADE. See BELLADONNA.

DEAD NETTLE, *Lamium*, a genus of plants of the natural order *labiatæ*, having a 5-toothed calyx and a 2-lipped corolla, the upper lip arched, the lower lip trifid. The name D. N.—popularly in some parts both of England and Scotland, *Dee nettle*—is also often extended to the genera *galeopsis* and *galeobdolon*, genera very similar to *lamium*, the first of which is sometimes distinguished by botanists as hemp-nettle, the second as weasel-snout. *Lamium purpureum*, *L. incisum*, *L. album*, and *galeopsis tetrahit*, are very common British weeds, some of them appearing in almost every garden, cornfield, or piece of waste-ground. *L. purpureum* and *L. album* are sometimes boiled as pot-herbs in Sweden. It is probably to *G. tetrahit*, or *G. versicolor*, also very common in Scotland, much larger plants, and rough with strong hairs, rather than to any species of *lamium*, that the popular belief relates of a power residing in the hairs of the D. N., particularly when the plant is dried, as in haymaking, of causing irritation in the hands of persons handling them, which, extending throughout the system, occasionally terminates in death. They do not, however, seem to possess any poisonous property. The subject is one perhaps deserving of more attention than it has received.

DEAD-RECKONING, a term in navigation, signifying the calculation of a ship's place at sea, made independently of celestial observations. The chief elements from which the reckoning is made are: The point of *departure*, i.e., the latitude and longitude sailed from, or last determined; the *course* or direction sailed in (ascertained by the compass); the rate of sailing—measured from time to time by the log (q.v.); and the time elapsed. The various principles or methods followed in arriving at the reckoning from these data are known as *plain-sailing*, *middle-latitude sailing*, etc. See SAILINGS. But the data themselves are liable to numerous uncertainties and errors, owing to currents, leeway (q.v.), fluctuations of the wind, changes in the declination of the compass, etc.; and therefore the results arrived at by the dead-reckoning have to be corrected as often as is possible by observation of the heavenly bodies. See NAVIGATION, LATITUDE, LONGITUDE.

DEAD SEA (anc. *Lacus Asphaltites*), called by the Arabs Bahr Loot, or *Sea of Lot*, is situated in the s.e. of Palestine, in lat. 31° 10′ to 31° 47′ n., and occupies a central position between long. 35° and 36° east. It is about 46 m. long, with a breadth of 10 miles in the middle. The depth of the D. S. varies considerably: soundings in the n. have given about 220 fathoms; this depth, however, gradually lessens towards the southern extremity, where the water is shallow. Its surface, which is lower than that of any water known, is 1312 ft. below the level of the Mediterranean. The shape is that of an elongated oval, interrupted by a promontory which projects into it from the s.e. The D. S. is fed by the Jordan from the n., and by many other streams, but has no apparent outlet, its superfluous water being supposed to be entirely carried off by evaporation. Along the eastern and western borders of the D. S., there are lines of bold, and in some cases perpendicular cliffs, rising in general to an elevation of upwards of 1000 ft. on the w., and 2,000 ft. on the east. These cliffs are chiefly composed of limestone, and are destitute of vegetation save on the e. side, where there are ravines, traversed by fresh-water springs. The n. shores of the lake form an extensive and desolate muddy flat, marked by the blackened trunks and branches of trees, strewn about, and incrusted with salt, as everything is that is exposed to the spray of the Dead sea. The southern shore is low, level, and marshy, and desolate and dreary in the highest degree; the air is choking, and no living thing to be seen. On this shore is the remarkable mass of rock called Usdum (Sodom). It is a narrow rugged ridge of hill, extending 5 m. n.w., and consisting of rock-salt. Large blocks have broken off from this hill, and lie strewn in all directions along the shore, adding to its dreary and death-like aspect. To the n. of Usdum, and at no great distance, is the supposed site of the ancient Sodom. Although the hills surrounding the D. S. are principally composed of stratified rock, yet igneous rocks are also seen; there are also quantities of post-tertiary lava, pumice-stone, warm springs, sulphur, and volcanic slag, clearly proving the presence here of volcanic agencies at some period. The neighborhood of the D. S. is frequently visited by earthquakes, on which occasions it has been observed that this lake casts up to its surface large masses of asphaltum, of which substance the cups, crosses, and other ornaments that are made and sold to pilgrims at Jerusalem chiefly consist. The long-entertained belief, that the exhalations from this lake were fatal, is not founded upon fact; birds have been seen

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flying over, and even sitting upon its surface. Within the thickets of tamarisk and oleander, which here and there may be seen upon its brink, the birds sing as sweetly as in more highly favored quarters. A curious plant grows on the borders of the D. S., the *asclepias procera*, which yields fruit called the apples of Sodom, beautiful on the outside, but bitter to the taste, and when mature, filled with fiber and dust.

The *water* of the D. S. is characterized by the presence of a large quantity of magnesian and soda salts. Its specific gravity ranges from 1172 to 1227 (pure water being 1000). The proportion of saline matter is so great, that whilst sea-water only contains 30 parts of salts in the 1000 parts, the water of the D. S. contains about 250, or eight times more than that of the ocean. The saltness of the D. S. has been explained in several ways; but there is no need to advert to more than one. It is a circumstance attending all lakes or collections of water without any outflow, that the water acquires an infusion of salt, its feeders constantly bringing in this material, while none can go off by evaporation. It may, moreover, be remarked that, if the D. S. was formerly at a higher level, and brought down to its present pitch by evaporation, a deposit of salt, such as we see on its banks, would be the natural consequence.

DEAD SEA FRUIT. See SODOM, APPLE OF.

DEADWOOD, county seat of Lawrence co., South Dakota, is the mercantile, financial, and mining centre of the Black Hills. It is in what is known as the Whitestone district, the most important mining section of the hills, and said to contain the largest gold mines and mills in the world. Deadwood has three banks, several churches, newspapers, an academy, public schools, city hall and court house, electric light, telephone, telegraph and water-works. It also has manufactures of lumber, iron, flour, brick and lime, beer, etc. Pop. '80, 8777; '90, 2366.

DEAF AND DUMB. Persons who are born deaf, or who lose their hearing at a very early age, are dumb also; hence the compound term deaf-*and*-dumb. But the primary defect is deafness; dumbness is only the consequence of it. Children ordinarily hear sounds, and then learn to imitate them; that is, they learn to repeat what they hear other persons say. It is thus that every one of us has learned to speak. But the deaf child hears nothing; cannot therefore imitate, and remains dumb.

The term "deaf and dumb" is somewhat unfortunate, as embodying and repeating the error that the affliction is twofold. It affects two organs, certainly, but only, as above described, in the way of cause and effect. The organ or hearing is wanting, but the organs of speech are present; they merely lack the means of exercise. The ear is the guide and directress of the tongue; and when she is doomed to perpetual silence, the tongue is included in the ban; though, if we could by any means give to the ear the faculty of hearing, the tongue would soon learn for itself to fulfill its proper office. To correct the error involved in this apparent misnomer, some authorities use the terms *deaf-dumb* and *deaf-mute*. The latter seems to be a customary expression in America, as in France it is *sourds-muets*. In the Holy Scriptures, the same original word is translated "*deaf*" in some places (as in St. Mark vii. 32), and "*dumb*" or "*speechless*" in others. (See Matt. ix. 33, and Luke i. 22.).

In the United States, between 1851 and 1871, the number of persons under instruction increased from 1162 to 3,836, and altogether the work of education is advancing with very rapid strides. In Gt. Britain, 12,000 or 13,000 pupils have been educated since 1792—when the first public institution was opened—and at least an equal number in the United States since 1817. Add to these the pupils of the various continental institutions since 1760, when De l'Epée collected his little group of children in the environs of Paris, and Thomas Braidwood opened his school in Edinburgh, and we shall then see that the fruits of these men's labors have not been meager, but great and marvelous. Some isolated attempts had previously been made, by different men, in different countries, and at long intervals, to give instruction to one or two deaf and dumb persons, and their endeavors had been attended with various degrees of success. These several cases excited some attention at the time; but after the wonder at their novelty had subsided, they seem to have been almost forgotten, even in the countries where the experiments were made. Bede speaks of a dumb youth being taught by one of the early English bishops, known in history as St. John of Beverley, to repeat after him letters and syllables, and then some words and sentences. The fact was regarded as a miracle, and was classed with others alleged to have been wrought by the same hand. From this time, eight centuries elapsed before any record of an instructed deaf-mute occurs. Rodolphus Agricola, a native of Gröningen, born in 1442, mentions as within his knowledge the fact that a deaf-mute had been taught to write, and to note down his thoughts Fifty years afterwards this statement was controverted, and the alleged fact pronounced to be impossible, on the ground that no instruction could be conveyed to the mind of any one who could not hear words addressed to the ear. But the discovery which was to give the key to this long-concealed mystery was now at hand. In 1501, was born, at Pavia, Jerome Cardan (q.v.), a man of great but ill-regulated talents, who, among the numerous speculations to which his restless mind prompted him, certainly discovered the theoretical principle upon which the instruction of the deaf and dumb is founded. He says: "Writing is associated with speech, and speech with thought; but written characters and ideas may be connected together *without* the intervention of sounds," and

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he argues that, on this principle, "the instruction of the deaf and dumb is difficult, but it *is possible.*" All this, which to us is obvious and familiar, was a novel speculation in the 16th century. With us it is a common thing for a man to teach himself to *read* a language though he cannot pronounce it. There are, for instance, hundreds of persons who can read French who do not and cannot speak it. Now, it is evident in this case that written or printed words do impart ideas independently of sounds, yet this was a discovery which the world owes to Jerome Cardan; and it was for want of seeing this truth, which to us is so familiar, that the education of the deaf and dumb was never attempted, but was considered for so many centuries to be a thing impossible. It was in Spain that these principles were first put into practice by Pedro Ponce, a Benedictine monk, born at Valladolid in 1520, and again a century afterwards by another monk of the same order, Juan Paulo Bonet, who also published a work upon the subject, which was the first step towards making the education of the deaf and dumb permanent, by recording the experience of one teacher for the instruction of others. This book, published in 1620, was of service to De l'Epée 150 years later; and it contains, besides much valuable information, a manual alphabet identical in the main with that one-handed alphabet which is now in common use in the schools on the continent and in America. From this time there was a general awakening of the attention of intellectual men, not only to the importance of the subject, but to the practicability of instructing the deaf-mute. One of Bonet's pupils was seen by Charles I., when prince of Wales; and the case is described by sir Kenelm Digby, who was in attendance upon the prince, on his memorable matrimonial journey into Spain. When the art died away in that country, it was taken up by Englishmen, and began forthwith to assume an entirely new aspect. Dr. John Bulwer published, in 1648, his *Philocophus, or the Deafe and Dumbe Man's Friend;* Dr. William Holder published his *Elements of Speech, with an Appendix concerning Persons Deaf and Dumb*, in 1669; and Dr. John Wallis, Savilian professor of mathematics in the university of Oxford, both taught the deaf and dumb with great success, and wrote copiously upon the subject. In 1662, one of the most proficient of his pupils was exhibited before the royal society, and in the presence of the king. The *Philosophical Transactions* of 1670 contain a description of his mode of instruction, which was destined to bear ample fruits long after his death.

Before the close of the 17th c., many works of considerable merit appeared, the chief of which are the *Surdus Loquens* (the Speaking Deaf Man) of John Conrad Amman, a physician of Haarlem; and the *Didascolocophus*, or Deaf and Dumb Man's Tutor, of George Dalgarno. This treatise, published in 1680, and reprinted some years ago by the Maitland Club, is eminently sound and practical, which is the more remarkable, as the author speaks of it as being, for aught he knows, the first that had been written on the subject. He is the first English writer who gives a manual alphabet. The one described by him, and of which he was the inventor, is, most probably, the one from which our present two-handed alphabet is derived. Dalgarno was by birth a Scotchman, but was long resident at Oxford. He died in 1687, and Dr. Wallis in 1703. From that time until 1760, nothing more was done in this country—though the subject was beginning to excite some attention in France—to resume the work which had been thus far prosecuted and helped on by the writings and labors of these eminent men. In 1760, when the abbé De l'Epée was opening his little school in Paris, the first school in the British dominions was also established in Edinburgh, by Thomas Braidwood. He commenced with one pupil, the son of a merchant in Leith, who had strongly urged him to carry into effect the plan of instruction followed by Dr. Wallis, and described in the *Philosophical Transactions* 90 years before. This school, the parent and model of the earlier British institutions, was visited and spoken of by many of the influential men of that day, and its history and associations are imperishable. Its local name of *Dumbiedikes* suggested to sir Walter Scott a designation for one of his most popular characters in the *Heart of Midlothian*. A visit paid to it in 1773, by Dr. Johnson and his biographer Boswell, supplies one of the most suggestive and characteristic passages in the *Journey to the Western Islands*. In the year 1783, Mr. Braidwood removed to Hackney, near London, and the presence of his establishment so near to the metropolis undoubtedly led to the foundation of the London Asylum in 1792. Dr. Watson, its first principal, was a nephew, and had been an assistant, of Mr. Braidwood; and he states that, some 10 or 15 years previously, the necessity for the establishment of a public institution had been plainly seen, and some few but insufficient steps taken towards the accomplishment of such a design. From its foundation in 1792 until 1829, it was directed with great ability by Dr. Joseph Watson, in whose work on the *Instruction of the Deaf and Dumb* this statement is given. On his decease, he was succeeded by his son, Mr. Thomas James Watson, of Clare Hall, Cambridge, and he again was followed in 1857 by his eldest son, the Rev. James H. Watson, of Pembroke college, Cambridge.

The mental condition of the deaf and dumb is so peculiar—so entirely unlike that of any other branch of the human family—that it is extremely difficult, without very close thought, to obtain an accurate conception of it. While almost every one will readily admit that there is a wide difference between a deaf and a hearing child, very few, who have not had their attention painfully drawn to the subject, possess any adequate notion of the difference, or could tell wherein it consists. Sometimes the deaf

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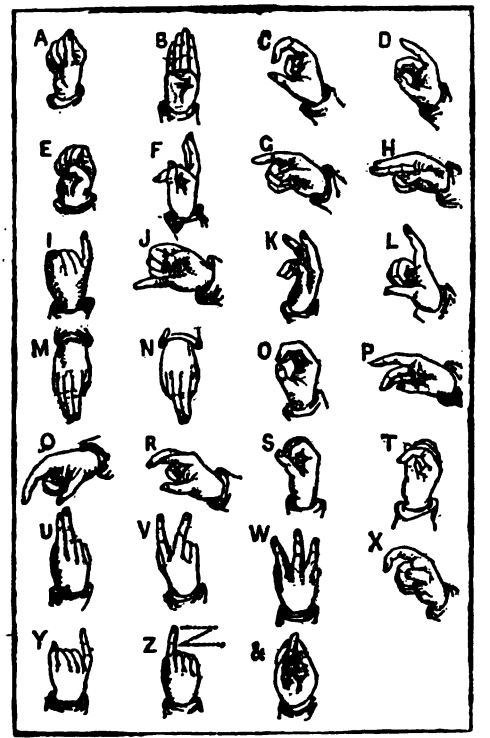
are compared with the blind, though there exists no proper ground of comparison between them. Except that the blind are more *dependent* than the deaf and dumb, the relative disadvantages of the two classes do not admit of a moment's comparison. The blind man can be talked with and read to, and is thus placed in direct intercourse with the world around him: domestic converse, literary pleasures, political excitement, intellectual research, are all within his reach. The person born deaf is utterly excluded from every one of them. The two afflictions are so essentially dissimilar, that they can only be considered and spoken of together by way of contrast. Each of them affects both the physical and the mental constitution; but blindness, which is a grievous bodily affliction, falls but lightly on the mind; while the effect of deafness is the extreme reverse of this—it touches only one bodily organ, and that not visibly, but the calamity which befalls the mind is one of the most desperate in "the catalogue of human woes." The deprivation under which the born-deaf labor is not merely, or so much, the exclusion of sound, as it is the complete exclusion of all that information and instruction which are conveyed to our minds, and all the ideas which are suggested to them, by means of sound. The deaf know almost nothing, because they hear nothing. We, who do hear, acquire knowledge through the medium of language—through the sounds we hear, and the words we read—ever hour. But as regards the deaf and dumb, speech tells them nothing, because they cannot hear; and books teach them nothing, because they cannot read; so that their original condition is far worse than that of persons who "can neither read nor write" (one of our most common expressions for extreme ignorance); it is that of persons who can neither read nor write, nor hear, nor speak; who cannot ask you for information when they want it, and could not understand you, if you wished to give it to them. *Your* difficulty is to understand *their* difficulty; and the difficulty which first meets the teacher is, how to simplify and dilute his instructions down to their capacity for receiving them.

A class thus cut off from all communication through the ear, can only be addressed through the eye; and the means employed in the instruction of the deaf and dumb are —1. The *visible* language of pictures, and of signs and gestures; 2. The finger-alphabet (or dactylology), and writing, which make them acquainted with our own *written* language; and in some cases, 3. Articulation, and reading on the lips, which introduce them to the use of *spoken* language. The education of the deaf and dumb must be twofold—you must awaken and inform their minds by giving them ideas and knowledge, and you must cultivate them by means of language. The use of signs will give them a knowledge of things; but to this must be added a knowledge of words. They are therefore taught, from the first, that words convey the same ideas to our minds which pictures and signs do to theirs; they are therefore required to change signs for words until the written or printed character is as readily understood as the picture or the sign. This, of course, is a long process, as it has to be repeated with every word. Names of visible objects (nouns), of visible qualities (adjectives), and of visible actions (verbs), are gradually taught, and are readily acquired; but the syntax of language, abstract and metaphorical terms, a copious diction, idiomatic phraseology, the nice distinctions between words called synonymous, and those which are identical in form, but of different signification—these are far more difficult of attainment; they can only be mastered through indomitable perseverance and application on the part of the pupil, in addition to the utmost skill and ingenuity of the teacher. The wonder, therefore, surely is, seeing the point of starting, that this degree of advancement is ever reached at all.

Yet it has been set forth by otherwise respectable authority, that the deaf and dumb are a "*gifted* race;" that they are remarkable for "their promptitude in defining abstract terms;" and those who ought to have known better, have strengthened this delusion, by putting forth, as the *bonâ-fide* answers of deaf-mutes, those brilliant aphorisms and definitions of Massieu and Clerc, which are so often quoted at public meetings, by eloquent speakers who know nothing of the subject. It is very well known to those who *are* acquainted with the subject, that the so-called definitions of *Hope*, *Gratitude*, *Time*, *Eternity*, etc., were not Massieu's at all, but those of his master, the abbé Sicard. The influence of these fallacies has been most mischievous; they raise expectation to an unreasonable height, for it is thought that what was done by "the celebrated pupil of the abbé Sicard," may be done every day: and disappointment is the inevitable consequence. The honest, laborious teacher who cannot produce these marvelous results, and will not stoop to deception, has often to labor on without that appreciation and encouragement which are so eminently his due; the cause of deaf-mute instruction suffers, and a young institution is sometimes crippled by the failure of support, which was first given from one impulse, and is now withdrawn from another—not a whit more unreasonable than the first, but very unfortunate in its consequences.

The course of instruction is very much the same in all the public schools of Gt. Britain, but a vigorous effort is now being made, by the advocates of what is called the "German system," to teach by oral instruction only. If they can produce, *on an extensive scale*, the results which have been obtained in some special and exceptional cases, they will assuredly deserve all the success they hope for, and merit the highest commendation. But it will not be sufficient merely to show that their system is superior to the one in present use, unless they can also show that it can be as extensively applied. The dispensers of the funds of our institutions are bound to uphold that

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One-handed Alphabet.



Two-handed Alphabet.

system which will confer the largest practicable amount of benefit upon the largest possible number of persons. To make a few brilliant scholars, and to produce a number of ready and intelligible speakers, will certainly be a very creditable achievement; but that will not justify any claim to *supersede* the humbler but more useful system under which so many thousands of our deaf-mute fellow-citizens have been rendered competent for the duties of life, in the workshop, in their families, and in society, and to "walk in the house of God as friends."

The manual alphabet in common use in the schools of Gt. Britain is the two-handed one, though the other is used in some of the Irish institutions, and is regarded with favor by a few of the English teachers. The arguments in its favor, like those for the decimal currency, may probably be admitted; it would be better if we had it. But the rival system has got possession, and is in familiar use, and persons are apt to think that the inconveniences of making the change would outweigh the advantages to be expected from it. The institutions in Great Britain are supported by annual subscriptions, donations, and legacies, and by the payments of pupils for their board. The larger benefactions are invested, where the annual income from ordinary sources will admit of it. Committees, chosen from the body of subscribers, direct the affairs of these institutions, the executive officers being the head-master and the secretary; but in some cases the sole charge is intrusted to the principal. The gentlemen who fill this office have devoted their whole lives to the work; some of them have also done good service by their writings upon the subject. The census report, 1871, specially mentions the works of Messrs. Baker of Doncaster, Scott of Exeter, and Buxton of Liverpool, each of whom has helped to make it better known and better understood than it could possibly be when it was treated by men with no practical knowledge, as a merely literary topic, or a subject of philosophical curiosity. Justice also requires the mention here of the valuable writings of the late Dr. H. P. Peet, of New York, and other American instructors of the deaf and dumb. The institutions in the western world are munificently supported by grants from the states, and appear to be admirably managed. The staff of teachers is numerous, able, and efficient, and a high degree of success may fairly be expected where the work is carried on under advantages which are unknown in the schools of Great Britain. At Washington, a college has

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been established, and is in successful operation, under the presidency of Dr. E. M. Gallaudet, the youngest son of the founder of the American asylum. In New York, an elder brother of this gentleman, the Rev. Dr. Thomas H. Gallaudet, has ever since 1852 conducted services in his church in the sign language, and in 1872, organized a commission to promote the temporal and spiritual welfare of adult deaf-mutes.

In London, a church has been built to meet the same necessity, and religious services are conducted by two chaplains and four laymen, in various parts of the metropolis; Manchester also posseses a chaplain and lay-helpers employed in the same work; in Edinburgh, Glasgow, and Dublin, also in Birmingham, and the large manufacturing towns of Yorkshire, special funds are raised, and special agents employed, to promote in like manner the social and religious benefit of the deaf and dumb. In Liverpool the same results are aimed at by voluntary agency, where, besides the Sunday services, lectures are given during the week, when a library and reading-room are thrown open, a penny-bank has been brought into successful operation, and a benevolent society visits the sick, helps the needy, and buries the dead.

The systematic and intelligent organization of institutions to educate the deaf and dumb in the United States dates from the early part of this century. An essay on *Teaching the Deaf to Speak*, by Dr. W. Thornton, of Philadelphia, was published in 1793, and in 1811, a grandson of Braidwood tried to establish a school in New York and Virginia, but failed in both instances. The circumstances which led to the opening of the Connecticut asylum at Hartford, April 15, 1817, are as follows: A deaf-mute little girl in the family of Dr. Cogswell, an eminent physician in Hartford, attracting some attention, it was soon afterward found that there were other deaf-mutes in the country. It was decided to send some one abroad to acquire the art of educating them; and to establish a school for this purpose funds were raised, and the Rev. F. F. Gallaudet, D.D., was selected for this work. He left the United States May 15, 1816, to execute this mission. The institution was incorporated by the Connecticut legislature in May, 1816, with an appropriation of $5,000. Dr. Gallaudet returned to America in August of the same year, accompanied by Laurent Clerc, a deaf-mute pupil of the abbé Sicard, and they immediately commenced collecting funds to start the school. The enterprise excited general interest; individuals and churches contributed liberally, and the sum of $12,000 was raised in the course of a few months. Early in 1819, the government of Massachusetts followed the example of Connecticut by providing for the education in the asylum of twenty indigent pupils from that state. The appropriation was afterwards enlarged so as to meet the demands of this entire class. New Hampshire made a similar provision in 1821, and Vermont and Maine in 1825. In 1834, South Carolina and Georgia decided to send their indigent deaf-mutes to the asylum, and in 1848, Rhode Island came into the same arrangement. In 1819, congress made a grant to the institution of 23 acres of wild land, the proceeds of which now form a fund of $339,000. It was owing to this munificent gift that the name of the school was changed to the "American Asylum." Before the school at Hartford was in operation, efforts had been made to establish a similar institution in the city of New York; a society was formed which was incorporated April 15, 1817, as the "New York Institution for Instruction of the Deaf and Dumb." Watson's book was taken as a guide, and articulation was taught in cases where the scholar appeared to possess the necessary aptitude, but this method did not prove very successful; and in 1827, the legislature, which had provided since 1822 for the support of 32 pupils, authorized an investigation by the superintendent of common schools of the state, who recommended in his report the introduction into the New York school of the improved methods in use at Hartford and Philadelphia. In consequence of that recommendation the directors finally succeeded in engaging, in 1831, the permanent services of Harvey P. Peet, LL.D., then one of the most efficient instructors in the American asylum. He served as principal from 1831 to 1867, and has a worthy successor in his son Isaac Lewis Peet, LL.D. Under the management of these two able teachers the institution has taken its place among the most successful schools for deaf-mutes in the world. Its grounds comprise about 26 acres, upon the banks of the Hudson river at Washington Heights. The institution has a shoe-shop, tailor-shop, and carpenter-shop, a printing-office, garden, and seamstress rooms connected with the school, in which the pupils receive competent instruction to prepare them for self-support by manual labor, as in all our large asylums. Prof. E. Henry Currier, a leading teacher of this establishment, has secured better results than are usually met with in giving articulation to the dumb and lip-reading to the deaf. Most of his pupils have attained such distinctness of pronunciation and such quickness in recognizing the fleeting indications of words which are made in ordinary utterance, that they have given their instructor a reputation which is attracting more and more pupils of this class to the institution. The method of teaching articulation by visible speech was invented by A. Mellville Bell in England about 1848, and consists of a species of phonetic writing based on the action of the vocal organs in producing sound. The Pennsylvania institution was organized at Philadelphia in 1820 by Joseph Seixas, a Jew of Portuguese descent. Among its first instructors were Laurent Clerc and Lewis Weld, the latter filling the office of principal till 1830, when he was recalled to Hartford to succeed Dr. Gallaudet. The Kentucky asylum at Danville was incorporated in 1823, and the Ohio asylum at Columbus was opened in 1829. Virginia, Indiana, Tennessee, Illinois, North Caro-

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lina, Georgia, South Carolina, Missouri, Wisconsin, and Michigan, incorporated institutions, in the course of the next 25 years, and at the present time every state has provided for the education of the deaf and dumb who are adopted "as wards of the commonwealth;" the state regarding it as a primary duty that they shall not be excluded from those educational privileges accorded to every member of the community. Most of these institutions derive their whole income from annual legislative appropriations. The usual term of attendance is 5 years, but the legal term of instruction in most states is 7 years, and may be extended in cases of good scholarship; the average annual cost for board, lodging, and tuition for each pupil supported by the state is $325. There are 51 institutions in the United States, a national college at Washington organized by E. M. Gallaudet, LL.D., and 6 institutions in Canada. Religious services have been conducted since 1850 by the Rev. Thomas H. Gallaudet, D.D., eldest son of the founder of the American asylum, at St. Ann's chapel for deaf-mutes, in New York city, but he and his assistants preach frequently in other parts of the country. The *American Annals of the Deaf and Dumb*, a quarterly periodical, has been published since 1847; conventions of the principals and instructors have been held every few years since 1850, at which papers containing valuable information have been read. Elementary manuals for the deaf-mute have been written in this country by H. B. Peet, J. S. Hutton, Jacobs, Keep, and others. An enumeration of the deaf and dumb is made in the decennial census of the United States, and the proportion is about 1 in 2,000. Of the post-natal causes it has been found that scarlet fever has since 1830 produced 20 to 25 per cent of the total cases; scrofula and spotted fever have also caused a large proportion.

INSTITUTIONS FOR THE INSTRUCTION OF THE DEAF AND DUMB, 1887–88.

	Location.	Name.	Date of Opening.	Pupils.			
				Male.	Female.	Articulation.	Lip-Reading.
1	Talladega, Ala	Alabama Institution	1858	40	20	16	16
2	Little Rock, Ark	Arkansas Institute	1867	56	56	23	23
3	Berkeley, Cal	Inst. for Deaf and Blind	1860	79	51	27	27
4	Colorado Springs, Colo	Inst. for the Mute and Blind	1874	32	30	15	15
5	Hartford, Conn.	American Asylum	1817	62	82	70	70
6	Mystic Bridge, Conn.	Whipple's Home School	1868	13	12	25	25
7	Sioux Falls, S. Dak.	S. Dakota School for Deaf-Mutes	1880	10	10	..	..
8	Washington, D. C.	Columbia Inst. { Kendal School.	1857	108	84	35	35
		Columbia Inst. { Nat. College	1864	46	6	..	..
9	St. Augustine, Fla.	Blind and Deaf-Mute Inst.	1885	18	5	11	14
10	Cave Spring, Ga	Georgia Institution	1846	55	31	4	4
11	Chicago, Ill	Day Schools for Deaf-Mutes	1875	(52)		13	13
12	Chicago, Ill	Ephpheta School	1884	19	28	23	23
13	Englewood, Ill	Voice and Hearing School	..	15	11	26	26
14	Jacksonville, Ill	Illinois Institution	1846	302	204	150	150
15	Evansville, Ind.	Evansville Deaf-Mute School	1886	17	6	0	0
16	Indianapolis, Ind.	Indiana Institution	1844	167	133	48	48
17	Council Bluffs, Iowa	Iowa Institution	1859	185	138	..	..
18	Olathe, Kans.	Kansas Institution	1861	131	104	70	70
19	Danville, Ky	Kentucky Institution	1823	108	91	13	..
20	Baton Rouge, La.	Louisiana Institution	1852	103	91	..	..
21	New Orleans, La.	Public School for Deaf-Mutes	1886	10	0	0	0
22	Portland, Me	Portland School for Deaf	1876	25	29	54	54
23	Baltimore, Md	School for Colored Blind and Deaf-Mutes	1872	14	2	12	..
24	Baltimore, Md	Mr. Knapp's Institute	1878	19	9	..	..
25	Frederick, Md	Maryland School for Deaf and Dumb	1868	52	43	68	68
26	Beverly, Mass.	New England Industrial School	1879	13	9	14	14
27	Boston, Mass.	Horace Mann School	1869	33	48	81	81
28	Northampton, Mass	Clarke Institution	1867	46	52	98	98
29	Flint, Mich.	Michigan School for Deaf	1854	163	137	75	..
30	Norris, Mich.	Evangelican Lutheran Inst.	1874	(37)		37	36
31	Faribault, Minn.	Minnesota School for Deaf	1863	105	69	80	80
32	Jackson, Miss.	Mississippi Institution	1854	52	42	30	10
33	Fulton, Mo.	Missouri Institution	1852	144	115	64	64
34	St. Louis, Mo.	Convent of Maria Consilia Inst.	1885	10	25	5	5
35	St. Louis, Mo.	Day School for Deaf-Mutes	1878	28	16	..	..
36	Omaha, Nebr.	Nebraska Institute	1869	87	63	33	33
37	Chambersburg, N. J.	New Jersey School	1883	51	50	..	..
38	Santa Fé, N. Mex.	New Mexico School	1885	3	3	0	0
39	Buffalo, N. Y.	Le Couteulx St. Mary's Institution	1861	86	71	132	132
40	Fordham, N. Y.	St. Joseph's Institute	1869	(262)		171	171
41	Malone, N. Y.	Northern New York Institution	1884	51	23	21	21
42	New York, N. Y.	Articulation Class for Deaf-Mutes	1886	7	4	11	.
43	New York, N. Y.	Institution for the Improved Instruction	1867	112	92	204	204
44	New York, N. Y.	New York Institution	1818	249	198	0	344

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	Location.	Name.	Date of Opening.	Pupils.			
				Male.	Female.	Articulation.	Lip-Reading.
45	Rochester, N. Y.	Western New York Institution	1876	92	72	164	164
46	Rome, N. Y.	Central New York Institution	1875	100	70	80	90
47	Raleigh, N. C.	North Carolina Institution	1845	(106)		..	..
48	Cincinnati, Ohio	Cathedral School for Deaf	1887	12	11	0	0
49	Cincinnati, Ohio	Cincinnati Deaf-Mute Day School	1875	10	9	0	0
50	Cincinnati, Ohio	Oral School for the Deaf	1886	4	11	15	15
51	Columbus, Ohio	Ohio Institution	1828	250	222	100	100
52	Salem, Oregon	Oregon School for Deaf-Mutes	1870	14	13	5	..
53	Philadelphia, Pa.	Pennsylvania Institution	1821	263	224	120	120
54	Philadelphia, Pa.	Private School for Teaching Deaf Children to Speak	1885	13	1	14	14
55	Scranton, Pa.	Pennsylvania Oral School	1883	(33)		33	33
56	Wilkinsburg, Pa.	Western Pennsylvania Institution	1876	90	58	29	29
57	Providence, R. I.	Rhode Island State School	1877	16	21	37	37
58	Cedar Spring, S. C.	South Carolina Institution	1849	(76)		21	21
59	Knoxville, Tenn.	Tennessee School for Deaf and Dumb	1845	87	64	13	13
60	Austin, Tex.	School for Colored Deaf-Mutes and Blind	1887	(25)		..	..
61	Austin, Tex.	Texas Deaf and Dumb Asylum	1857	84	57	34	34
62	Salt Lake City, Utah	Department of the Univ. of Deseret	1884	13	13	..	..
63	Staunton, Va.	Virginia Institution	1839	44	43	25	25
64	Vancouver, Wash.	Washington School, Defective Youth	1886	12	8	..	..
65	Romney, W. Va.	West Virginia School for Deaf and the Blind	1870	46	40	25	25
66	Delavan, Wis.	Wisconsin School for the Deaf	1852	169	99	48	48
67	La Crosse, Wis.	Oral Department of Public Schools	1886	3	3	6	6
68	Milwaukee, Wis.	Milwaukee Day School for the Deaf	1883	23	19	42	42
69	St. Francis Station, Wis.	St. John's Catholic Deaf-Mute Inst.	1876	16	12	10	4

Total Number pupils..... 7442

Canada has a number of institutions, including those for men and women, and the Mackay Institution, at Montreal, and the asylums at Halifax, N. S., Belleville, Ont., and Portland, N. B.

DEAF AND DUMB (in law). From the imperfect methods formerly in use for the education of the deaf and dumb, they were almost everywhere held to be legally in the same position as idiots and madmen. The Roman law held them to be incapable of consent, and consequently unable to enter into a legal obligation or contract. Both in England and America the amount of their capacity is now a question of fact, which, in cases of doubt, will be referred to a jury.

DEAFNESS may be complete or partial, may affect both ears or only one, may date from birth, be permanent or only temporary, and is but too often one of the distressing symptoms of advancing age. The causes of deafness are numerous. On glancing at the article AUDITORY NERVE, the reader will at once remark the extraordinary intricacy of the hearing-apparatus there described, and will easily conceive that although it be contained in a little nut of densest bone (the petrous portion of the temporal), still it is exposed to many deteriorating influences, and that very slight causes may disarrange the exquisite adjustment of its parts. 1. The auditory nerve may itself be unsusceptible to the stimulus of sound, from some diseased condition at its origin in the brain, or at its final subdivision in the labyrinth. This is termed nervous deafness. 2. The structures which conduct the vibrations of sound to the labyrinth may be faulty, from accident or disease. 3. The passage leading to the tympanum or drum may be blocked up. 4. The cavity of the drum may have ceased to be resonant, owing to deposits from inflammatory attacks, to loss of its membrane, or air being excluded, from obstructions in the passage between it and the gullet (the Eustachian tube).

Nervous deafness may be caused by a sudden concussion, as from a "box on the ear," or a general shock to the whole body, as in the case of the celebrated Dr. Kitto, who lost his hearing, when a boy, by a fall from the top of a house. The concussion from loud sounds suddenly taking the ear unawares, before its small muscles have time to prepare themselves for the shock, causes the deafness which follows the firing of cannon. Even a loud yell close to the ear has been sufficient to destroy the hearing power on that side. As such an accident is generally accompanied by an increased flow of blood to the part injured, it may be relieved by the application of leeches, applied behind the auricle, and the ear should for some time be protected from loud sounds as carefully as possible. In some of these cases the nerve gradually recovers its sensibility, but in many the deafness continues, and is accompanied by a distressing singing in the

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ears. Exposure to cold affects the auditory nerve; and gouty persons, or those who are suffering from the poisons of typhus fever, scarlatina, measles, mumps, etc., frequently become deaf. Some medicines, as quinine, produce nervous deafness; so do debility and mental excitement; but all these causes seem to act in one way—viz., to increase the flow of blood to the ear, and should be treated accordingly.

The solid conductors of sound to the auditory nerve may be injured or diseased, so that the vibrations are interrupted. One curious cause of deafness has been recently shown to exist by Mr. Joseph Toynbee of London—viz., an increasing stiffness in the little joint by which the stirrup-bone moves in the oval window of the vestibule; this stiffness prevents the base of the stirrup pressing inwards sufficiently to affect the contents of the labyrinth, therefore it ceases to keep the auditory nerve *en rapport* with the membrane of the drum. This condition may be recognized during life by the patient losing the power of adapting his hearing to varying sounds. Two persons speaking at once prevents his hearing the voice of either; there is a constant buzzing in the ear, and he gets deafer and deafer day by day. This curious disease is frequently associated with gout and rheumatism, and in its earlier stages may be influenced by the same remedies as these; but if once established, it is incurable.

Sound reaches the auditory nerve through the vibrations of the bones of the head, but chiefly through the external opening in the auricle, the passage leading from which is shut at the depth of an inch and a quarter from the surface by the membrane of the drum stretching across it. Should this passage be blocked up, so that the sounds can no longer pass along it to impinge upon the membrane, either total or partial deafness must result.

The most common obstruction is an accumulation of the wax secreted by a small ring of glands near the orifice. The object of this cerumen or wax is to catch the particles of dust floating in the atmosphere; but sometimes it is harder than usual, and is no longer gradually expelled by the movements of the jaw in speaking and eating. At last, it fills the passage in the form of a hard plug, and sounds can neither pass through it nor by its side; if left, it gradually causes serious changes in the shape of the passage, and even symptoms resembling diseases of the brain. Sometimes foreign bodies find their way into this passage, or tumors grow in it, and no unprofessional attempts should be made to remove them, lest the membrane of the drum be injured. It is but seldom that any instruments are necessary in addition to a stream of water thrown briskly in by means of a syringe, with a nozzle smaller than the circumference of the passage. Should the wax be very firm and hard, is is well to soften it by dropping in some oil or an alkaline solution. But even a stream of water, unless great care be taken, may injure or burst the delicate membrana tympani, and the proceeding leave the patient suffering from a more serious condition than before.

A membrane, to be resonant, must have air on both sides of it, and the membrana tympani obtains this essential by means of the Eustachian tube, the lower orifice of which, on each side of the gullet, opens for a brief period at each act of swallowing, and admits a small quantity of air, which ascends into the tympanic cavity, if the tube is in a healthy condition; but frequently in persons suffering from relaxed mucous membrane, the Eustachian passage becomes swollen and impassable, or blocked up by some thickened mucous secretion. During a common cold, persons often suffer from this cause of deafness. It has been supposed by some, that enlarged tonsils may interfere with the pharyngeal opening of the tube, and with that view they cut portions off them occasionally with great benefit to the condition of throat in which these glands are enlarged; but the latter are situated below and in front of the Eustachian tubes, and cannot be the immediate causes of the obstruction.

In some cases, the membrane of the drum may be perforated; and though the mere perforation is not sufficient to cause more than a slight degree of deafness, if the mucous membrane lining the tympanic cavity be thickened at the same time, the person is usually able to hear only the loudest sounds. If the perforation be stopped up, however, the air confined in the tympanic cavity vibrates sufficiently to stimulate the auditory nerve, through the round window of the labyrinth, and a useful degree of hearing is restored. In 1848, Mr. Yearsley of London showed that a small pellet of cotton-wool might be used for this purpose. It should be moistened with fine oil, and inserted on the end of a probe. Patients generally learn how to stick it neatly into the aperture themselves. It should be removed every three or four days, or oftener, should cleanliness require it.

Mr. Toynbee has invented an artificial membrana tympani of vulcanized india-rubber, attached to the end of a fine silver wire, by which it can be inserted or withdrawn. These beautiful little instruments may now be obtained of every surgical instrument maker, and are at least worth trying in cases of perforated membrana tympani, as they often do good, can do no harm, and are very cheap. The india-rubber having been pared to the size likely to fit the individual's ear, it is moistened with warm water, and gently passed down the auditory passage; the sensations of the patient will easily decide when it has gone far enough, and he gladly discovers, by the sound of his own voice or that of the surgeon, that his hearing has been suddenly improved.

The deafness of aged persons has been shown, by Mr. Toynbee, to be generally caused by the effects of previous inflammatory attacks, and may frequently be much

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relieved by counter-irritation behind the ear, alterative medicines, and washes which restore the healthy condition of the throat and the external auditory passage.

There are numerous "cures for deafness" advertised from time to time; some are harmless if useless, others are useless, but very dangerous, owing to the readiness with which inflammation may be set up, and the liability of the latter to extend to the brain or its membranes. The diseases which affect the ear are the same as affect other organs, and require to be treated upon the same principles. It is advisable, as soon as the first symptoms of approaching deafness are felt, to apply to one of the regularly qualified practitioners who devote themselves entirely to the subject, and to have nothing to do with these so-called *cures*, which benefit only the vendors.

The best English works on the subject are *Practical Observations on Aural Surgery*, by William R. Wilde of Dublin, and *The Diseases of the Ear*, by Joseph Toynbee of London.

DEAF SMITH, a co. in n.w. Texas; formed in 1876, and organized in 1890. 1410 sq. m.; pop. '90, 179. Co. seat, La Plata.

DEAK, FRANZ, Hungarian politician, was b. in 1803 at Kehida, in the Hungarian co. of Zala. Having studied law at Raab, he began to practice as an advocate in his native county, and soon became noted for his eloquence and enlightened patriotism. Elected in 1832, to the national diet, he, as leader of the liberal opposition, opposed, by legal and constitutional means, every attempt of the imperial government to infringe on the constitutional rights of his country. This firm and moderate policy enabled him to effect more than one reconciliation between Hungary and the Austrian emperor as her king--temporarily in 1840, and in 1867 more permanently. While upholding the independence of his country, he labored for its internal improvement, promoting measures for the elevation of the peasantry, and advocating the abolition of the odious exemption from taxes enjoyed by the nobility. His views on this last point displeased the party of the nobles, and for some years after 1840, his county did not return him to the diet. He still, however, continued to guide the councils of the moderate liberal party, and in spite of his aversion to extreme measures, he promoted the association for national defense, in the view of a possible struggle with Austria. After the revolution of March, 1848, he became minister of justice in the cabinet of count Batthyanyi (q.v.), and had formed the project of effecting a general reform in the administration of justice in Hungary, which, however, the war rendered impossible. D. used every effort to ward off the war, and come to an arrangement with Austria. On Kossuth's coming into power (Sept. 17, 1848), D. resigned his portfolio, and retained only his place in the diet. In the last months of 1849, at the approach of prince Windischgrätz, he proposed to sue for peace, and was one of the deputies sent for this purpose to the Austrian gen. It is well known that that step failed, and that D. was even for some time a prisoner at Pesth; he then withdrew from public affairs, and retired to his estate. When the Hungarian revolution was suppressed, he refused the invitation sent him by M. de Schmerling, minister of justice at Vienna, to take part in the legislative conferences, as he disapproved of the Austrian policy with regard to Hungary. He did not return to public life till 1860, when a constitution was granted to his country.

On hearing of the arrest of count Ladislas Téléki, D. set out for Vienna with M. Eötvös, and procured the release of his countryman, as well as the promise of an independent Hungarian ministry. Returned by the city of Pesth to the diet in 1861, he became in it the leader of the moderate party, at the same time that the extreme party collected round count Téléki. The death of the latter (8th May) destroyed the only influence which could counterbalance that of D.; and the diet appointed him to draw up the address to the emperor. D. demanded, in that paper, the constitution of 1848, a Hungarian ministry resident in Pesth, the return, without restriction, of the exiles, and the restitution of their property. Rejected at first by the emperor, this address was again drawn up with some modifications in the details; the emperor answered it by a rescript which with difficulty dissimulated his repugnance to such an arrangement; and in his turn, D., in name of the diet, protested publicly against the imperial rescript. On the 23d, the emperor pronounced the dissolution of the Hungarian diet, which protested anew, under the direction of D., against the illegality of the measure which dispersed them Among the events consequent on the war between Austria and Prussia in 1866, was the final triumph of D.'s policy in the establishment of a constitutional relation between Hungary and Austria. At a general election in 1869, the results of which were favorable to his policy, D. was, by an overwhelming majority, returned again for the city of Pesth. D. died in 1876. A memoir was published in London in 1880.

DEAL, a municipal borough, market town and sea-bathing place, in the e. of Kent, on a bold open beach, near the s. extremity of the Downs, between North and South Foreland, 18 m. e.s.e. of Canterbury, and 8 m. n.n.e. of Dover. It has three streets running parallel to the beach, and others stretching into the country. A fine anchorage extends 7 or 8 m. between D. and the Goodwin Sands. D. has mainly arisen to supply the wants of vessels detained by the winds in the Downs. The chief branches of industry are connected with maritime pursuits, boat-building, sail-making, piloting or hoveling, victualing, and naval stores. Pop. '91, 8898. Until 1885 D. returned two members to parliament with Sandwich and Walmer. It has been one of the Cinque

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ports since the 13th century. The coast near D. is defended by Deal castle, near the town; Sandown castle and three batteries on the n.; and by Walmer castle, a mile to the south. Walmer castle is the official residence of the warden of the Cinque ports, and here the duke of Wellington died in 1852. Henry VIII. built Deal castle in 1539. Julius Cæsar, with two legions, in 82 ships, landed near D. in 55 B.C. In 1877, 168 vessels, of 11,285 tons, entered the port.

The DEAL BOATMEN, an enterprising and courageous body of men, were like some of the other boatmen on that coast, locally known as "hovelers." They became noted for their skill and daring in giving assistance to ships in distress, and in saving the lives of crews and passengers. Besides performing these services, they were useful in carrying off provisions to outward-bound vessels, and in bringing ashore mail-bags requiring to be forwarded by express, but, in consequence of steam-tugs being much employed in expediting outward and inward bound vessels, and also from the mails from many foreign countries being landed at Falmouth and other places, to be forwarded to London by railways, the occupation of the Deal boatmen is gone, and the community has sunk into poverty. Their case being made known by the press, some benevolent exertions were made to succor them. Their number was by statute restricted to fifty-six.

DEALFISH, *Trachypterus*, a genus of fishes of the ribbon-fish family, having the body much compressed, and so named D. from the resemblance of the form to a piece of deal —a resemblance which is increased by the dorsal fin extending along the whole length of the back. The tail-fin exhibits a remarkable peculiarity, rising almost vertically from the horizontal line of the vertebral column, as if it had met with some accident, and assumed a new position. One species (*T. bogmarus*), the VAAGMAER of the Icelanders and Norwegians, sometimes occurs on the most northerly British coasts. It is not common even on those of Iceland, and is apparently a deep-sea fish. It is a large fish, 4 to 8 ft. in length, of a silvery color, with minute scales. Other species are found in the Mediterranean.

DEAL ISLAND, an island in Bass's strait, between Australia and Tasmania, is worthy of notice chiefly as having a light-house at an elevation of 880 ft. above the sea.

DEALS, the trade-name for fir-boards exceeding 6 ft. in length and 7 in. in width. They are also occasionally called "planks," though this term is now somewhat loosely applied. Pieces of smaller dimensions are called "battens." D. are usually 3 in. thick, and when sawed into thinner pieces, these are called "boards." When a deal is sawed into twelve or more thin planks, they are called "leaves." Most of the D. imported into this country are from the Baltic ports, North America, Sweden, and Norway. Drammen is the principal Norwegian timber-port, though the general name for the D. from Norway is "Christiania deals," so named from the Norwegian capital, where the principal timber-merchants reside, and through which the business of the trade is chiefly transacted. The duty on imported timber was finally abolished in the year 1866.

DEAN. The institution of deaneries, as of other ecclesiastical offices of dignity, bears a resemblance to the methods of ancient civil government. Thus, for the preservation of civil order, every hundred consisted of ten districts, called tithings, and in every tithing was a constable or civil dean. In conformity to this, the spiritual governors, the bishops, divided each diocese into deaneries or decennaries (Lat. *decem*, ten), corresponding to tithings, each of which was the district of ten parishes or churches, over every one of which a D. was appointed, who in the cities or large towns was called the D. of the city or town, and in the country, *rural dean*. It has been supposed, but on no certain authority, that the D. of a chapter was appointed to superintend ten canons; but it is more probable that the name was given to the office from its analogy to those above described. In the English church, there are the following dignitaries who bear this name:

1. In the province of Canterbury, it is part of the dignity of the archbishop to have prelates to be his officers, and of these the bishop of London is his provincial D.; and when a convocation is assembled, the archbishop sends to him his mandate for summoning the bishops of the province. This is the sole example of the kind.

2. *Honorary deans*, as the D. of the chapel royal of St. James's.

3. *Deans of peculiars*, as of Battle in Sussex, founded by William the Conqueror in memory of his conquest. There are also the deans of the Arches in London, of Bocking in Essex, and of Croydon in Surrey, who have jurisdiction, but no cure of souls.

4. *Deans of chapters*, as at Canterbury, St. Paul's, etc., who are governors over the canons in cathedrals and collegiate churches. Their appointment is in the direct patronage of the crown, which may appoint by letters-patent; and the D. so appointed is entitled to be installed. The D. of a chapter must reside eight months in the year, and he may hold one benefice with his deanery. The income of the office is, in the case of Durham, £3,000; of St. Paul's, Westminster, York, and Manchester, £2,000; of other cathedrals, £1000, except St. Davids and Llandaff, which have £700. See CATHEDRAL.

5. *Rural deans*. These are very ancient officers of the church, but custom gradually

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transferred their duties to the archdeacon, as in the visitation of churches, parsonage-houses, etc. They may, however, act as deputies to the bishop and archdeacon; and of late the office has been revived with great advantage; and in well-ordered dioceses affords a useful channel of communication between the bishop and his clergy, and a means of joint action in matters affecting the church. There are altogether nearly 600 rural deaneries in England and Wales.

In the universities of Oxford and Cambridge, the D. is the officer who superintends the discipline of the college and the chapel services. At Christ church, which is a cathedral, the D. is master of the college.

DEAN, WILLIAM, D.D., b. N. Y., 1807; became a missionary in 1834, under the American Baptist missionary union; served in China and in Siam; and translated the new Testament into Chinese. He d. in 1895.

DEAN OF THE **CHAPEL ROYAL** (Scotland), an office held by six (formerly three) clergymen of the established church, to which they are appointed by the crown. The benefice of the chapel royal, which was instituted by James V., was richly endowed, but it has been disputed whether the revenues now enjoyed by the deans belonged originally to the chapel royal of Stirling or to the chapel royal of Holyrood. It is known that the existing revenues were once attached to the see of Dunblane; and an act of parliament was passed in 1621, sanctioning the annexation of the revenues of the chapel royal of *Stirling* to the bishopric of Dunblane, which was the poorest bishopric in Scotland. Hence it is assumed that the whole existing deanery revenues belonged to the chapel royal of Stirling. But there are some facts which prove that the benefice was connected with the chapel at Holyrood equally with that at Stirling. William Couper, bishop of Galloway, held the office of dean of the chapel royal from 1615 to the commencement of 1619. He resided at the foot of the Canongate, and preached regularly in the royal chapel of Holyrood. This individual drew part of his revenue from the parishes of Kirkinner and Kirkcowan in the co. of Wigton, and part of the present deanery revenues is likewise drawn from the same parishes. Dr. Adam Bellenden, who was bishop of Dunblane when the act above mentioned was passed annexing the revenues of the chapel royal of Stirling to his bishopric, performed the duties of dean of the chapel royal at Holyrood for many years subsequent to 1621. It seems clear, therefore, that if the revenues of the benefice were ever divided between the two chapels, they were united to the see of Dunblane during the incumbency of Dr. Bellenden. The state of the case probably is, that at its institution by James V., who resided frequently at Stirling, the benefice was held by ecclesiastics chiefly resident there. The chapel royal is noticed as in full operation in Stirling in 1540. During the reign of queen Mary, the chapel royal seems to have been at Holyrood. In 1574, again, after the reformation, the name of Johne Duncaneson appears as minister of the chapell royall, or king's house at Stirling, where James VI., then very young, resided; while at Holyrood the minister was apparently the regular parish minister of Canongate, and not connected with the chapel royal. Afterwards, when the royal residence became fixed at Holyrood, the dean of the chapel royal officiated in the chapel, of which abundant proof exists in the history of the period. The chapel at Stirling was left to decay; whereas during the reigns of James VI., Charles I., Charles II., and James VII., the chapel royal of Holyrood was repaired and embellished. The last of the Stuarts laid out considerable sums for the purpose only the year before the revolution. The revenues of the benefice fell to the crown, *jure coronæ*, on the abolition of episcopacy in 1690, and have since been gifted at the royal pleasure. For a long period, the emoluments were not at all considerable, owing to the practice which existed of giving tacks or leases of the teinds to the proprietors of the lands at nominal rents. In consequence of the termination of some of those leases in 1841, and the deans being debarred in the gift of the appointment from accepting anything but the full yearly value of the revenues, a very great increase took place in the emoluments, which, however, were again somewhat diminished by augmentations made to the parochial clergy out of the teinds in question. A large portion of the revenue is drawn from the parishes of Yarrow and Ettrick, and the remainder from Wigtown, Kirkcudbright, and Ayr shires. In 1841, the annual rental divided among the three deans was £252; in 1858, £2018. The duties of the office used to be nearly nominal; but on the foundation of the chair of biblical criticism in the university of Edinburgh in 1846, it was endowed with one third of the revenues, the professor becoming one of the three deans. The universities commission, 1858, recommended that when the requisite vacancies occurred, the revenues should be divided into six parts, attached respectively to the chairs of divinity and Biblical criticism in Edinburgh university (the latter receiving ⅔ths of the whole), Biblical criticism in Aberdeen university, Biblical criticism in Glasgow university, and church history in St. Andrews university. This arrangement has now come fully into operation, the result being that the revenues of the chapel royal are divided among the incumbents of the above mentioned chairs. Besides these five deans, the dean of the order of the thistle bears the title of dean of the chapel royal, but draws none of the revenues.

DEANE, JAMES, 1748–1823; b. Conn.; graduate of Dartmouth, and for many years a missionary among the New York and Canadian Indians. He was an officer in the revolutionary war, and later in life, a judge in Oneida co., N. Y.

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DEANE, JAMES, 1801–58; b. Mass.; a physician and surgeon. He was the discoverer, 1835, of the fossil foot-prints in the red sandstone of the Connecticut valley, and at the time of his death was engaged upon an elaborate memoir on the subject for the Smithsonian institution. He wrote much on medical subjects.

DEANE, SILAS, 1737–89; b. Conn.; graduate of Yale, and member of the first continental congress. He was sent to Paris as political and financial agent of the colonies. Benjamin Franklin and Arthur Lee joined him afterwards, and he was on the committee which negotiated the treaty of peace with France. He was recalled in 1777 in consequence of extravagant contracts in which he had involved the colonies. An account of his doings was demanded on the floor of congress, but a full explanation was declined on the ground that his papers were in Europe. The affair put him under a cloud, and after many defensive and aggressive publications on the subject, he returned to Europe, 1784, and died in poverty.

DEAN OF FAC'ULTY, the president of the incorporation of advocates in Scotland. Like the other officers of the faculty, the dean is elected annually. In the U. S. the name is applied to an officer in each of the separate faculties of a university, in having charge of the discipline. He is usually the senior professor in that faculty. See ADVOCATE

DEAN FOR'EST, a picturesque hilly tract, 22,000 acres in extent, in the w. of Gloucestershire, between the Severn and the Wye. It is mostly crown-property, and about half of it is inclosed for the growth of timber for the navy. It contains oak, beech, etc., woods; orchards, yielding the famous Styre apple-cider; coal and iron mines; and stone-quarries for building, grinding, and making troughs and rollers. It is divided into six walks. The population is chiefly miners, once a lawless set. The former inhabitants had many ancient privileges—acquired by birth, and by working a year and a day in the forest—viz., exemption from rates and taxes, free pasturage, right of mining—a sixth of the produce being due to the sovereign, and access to the woods for timber for their works. The parliamentary division which is named from it includes nearly all of Gloucestershire west of the Severn.

DEAN OF GUILD, in Scotch burghs, was the head of the mercantile body called the guild-brethren. See GUILD. In former times (1593, c. 180), he was a judge in mercantile and maritime causes within the burgh, but for a very long period he has been rather what might be called a kind of Scotch edile. His chief duty is now to see that buildings within the burgh are erected according to law, that they are sufficient, and, in case of their falling into a ruinous condition, to order them to be pulled down. Though in some of the larger burghs the D. of G. is still (3 and 4 Will. IV. c. 76, s. 22) a member of the town-council, *ex officio*, his jurisdiction is altogether separate from that of the bailie-court. In Edinburgh, the D. of G. court, in addition to the D. of G., consists of a council of merchants and tradesmen chosen annually, and of the old or former dean of guild. They are assisted by the law assessors of the magistrates of the city. No building can be either erected or demolished, or even materially altered, without a warrant from this court. Opposition to the issuing of the warrant may be offered, either by a private party, or by the procurator-fiscal of the court itself, acting for the public interest. The enforcement of the act 1698, c. 8, as to the height of buildings, the thickness of the walls, etc., lies within the province of the D. of G. court. The judgments of the D. of G. court may be reviewed by the court of session.

DEARBORN, a co. in s.e. Indiana, on the Ohio river; traversed by the Baltimore and Ohio Southwestern, and Cleveland, Cincinnati, Chicago, and St. Louis railroads; 287 sq. m.; pop. '90, 23,364. Chief productions, wheat, corn, oats, barley, hay, butter, etc. Co. seat, Lawrenceburg.

DEARBORN, HENRY, 1751–1829; b. N. H.; a general in the revolutionary war. When news came to Portsmouth of the battle of Lexington, he quitted his practice as a physician, and marched with 60 volunteers so speedily as to arrive at Cambridge (65 m.) early the next day. He was in the battle of Bunker Hill, and with Arnold's expedition to Quebec, where he was taken prisoner. He was with Gates at the capture of Burgoyne, at Monmouth, and at Yorktown. Washington appointed him marshal for the district of Maine in 1789. In 1812, he was made senior maj.gen. of the federal army, and put in command of the northern department. In 1813, he captured York, Canada, and Fort George, at the mouth of the Niagara river. He resigned in 1815, and in 1822 was sent as minister to Portugal. Two years afterwards, at his own request, he was recalled.

DEATH. It is one of the fundamental doctrines of physiology, that every part of the organism has its own definite term of vitality, and that there is a continuous succession of the destruction of old cells and the formation of new ones in all tissues, and especially in those in which the most active vital changes are going on, as, for example, in the nervous and muscular tissues. Even the most solid portions of the animal frame, such as the bones and (to a less extent) the teeth, are undergoing a perpetual although a slower change of this nature; and throughout the whole body, there is a continuous removal of effete or worn-out tissues, and a corresponding deposition of new matter. Every blow we strike, every thought we think, is accompanied by the death and disintegration of a certain amount of muscular or nervous tissue as its necessary condition; and thus every action of our corporeal life, from its beginning to its close, takes place at the

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expense of the vitality of a certain amount of organized structure. This is termed *molecular D.*, and, within its proper limits, is obviously essential to the life and well-being of the organism.

The cessation of the circulation and respiration may be regarded as constituting *somatic D.*, or the D. of the entire organism, which must obviously be shortly followed by the molecular D. of every portion of the body.

We shall now briefly notice the principal modes in which D. occurs. D. happens either from the natural decay of the organism, as in old age, or (and much more frequently) from some of these derangements or lesions of the vital organs which occur in the course of the diseases and injuries to which we are liable. These derangements of the vital organs may occasion various modes of dying. Dr. Watson remarks in his *Lectures on the Principles and Practice of Physic*, that life rests on a tripod, whose three vital supports are the *heart*, the *brain*, and the *lungs*. Through the impaired functions of one or more of these organs, the tendency to D. is expressed. This is much the same as Bichat's statement, that "the mode of dying may begin at the head, the heart, or the lungs." The functions of these organs are, however, so mutually dependent upon each other, that impairment in the functions of one of them may lead to D., while the mode of dying is chiefly expressed through the functions of another.

When a person loses blood to such an extent that he faints, if the flow of blood be not arrested, the state of fainting or *syncope* continues, and the heart's action ceases. The cause of D. here is, not that the heart is unable to contract, but because its natural stimulus, the blood, does not enter it in sufficient quantity to excite contraction. This is termed D. by *anæmia*. In other cases, the stimulus from blood may be sufficient, but the heart may have lost its contractile power. Such a mode of death is said to be by *asthenia* (Gr. want of power). Many poisons and diseases, due to morbid materials in the blood (as, for example, cholera), prove fatal in this way.

D. may likewise be produced by suspension of the functions of respiration, as when access of the air to the lungs is impeded, or when the actions of the muscles of respiration cease, in consequence of disease or injury of the brain or spinal cord. The first of those modes is known as suffocation or *apnœa*, and we have examples of it in drowning, smothering, choking, strangulation, etc. Forcible pressure upon the chest, such as sometimes happens in great crowds, or as occurs to workmen partially buried by the fall of earth, etc., will cause D. in a few minutes, if movement of the lungs is prevented by the pressure. Tetanus and the poison of strychnine prove fatal in this way.

D. by coma, or beginning at the brain, is caused by obstruction to the circulation through that organ by pressure (as, for example, when there is effused blood within the cranium, or when a portion of bone is depressed in a fractured skull); by clots of blood within the vessels; by various narcotic poisons, such as opium, alcohol in excessive quantity, carbonic acid, etc.

To these forms of dying may be added (according to Dr. C. J. B. Williams) *necræmia*, or D. beginning in the blood, such as occurs in typhoid fevers and in other diseases of a malignant or pestilential kind. In this case, there is complete and general prostration of all the living powers. The blood, the natural source of life to the whole body, is itself dead, and spreads death instead of life. Almost simultaneously, the heart loses its power; the vessels, and especially the capillaries, lose their tone, and congestion takes place in various organs; the medulla oblongata, from which the chief respiratory nerves arise, is torpid; the powers of respiration fail; voluntary motion is almost suspended; molecular nutrition ceases, and is very rapidly followed by general molecular D.; that is to say, structures and even organs die, and begin to undergo decomposition as soon as the pulse and breath have ceased; and indeed, a partial change of this kind may even precede somatic D., as, for example, when parts become gangrenous, etc.

The signs of approaching D. require a brief notice. The mind may be affected in various ways; there may be dullness of the senses, vacancy of the intellect, and extinction of the sentiments, as in natural D. from old age; or there may be a peculiar delirium, closely resembling dreaming, which usually is of a pleasing and cheerful character.

> Saw ye not even now a blessed troop
> Invite me to a banquet, whose bright faces
> Cast thousand beams upon me like the sun?
> *King Henry VIII.*, Act iv. Scene 2.

In dreadful contrast with such visions, are those which haunt the dying minds of others, when it would sometimes almost appear as if the sinner's retribution commenced even on his death-bed.

Dementia or imbecility sometimes comes on shortly before D., and manifests itself by an incapacity of concentrating the ideas upon any one subject, and by an almost total failure of memory. The mental weakness is often exhibited by the pleasure which is derived from puerile amusements. The great dramatist from whom we have just quoted, notices "playing with flowers" as a token of approaching dissolution. In the form of delirium, ocular spectra seem frequently to be present, the patient apparently trying to catch some imaginary object.

There is generally well-marked relaxation and incapacity of the muscular system,

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and the voice is usually weak and low as D. approaches, often dwindling to a mere whisper. The mode in which the action of the heart declines is various; in most diseases of long standing, the cessation of the heart's action is gradual, the rate of the pulsations being much increased, but their energy being very much impaired. In some acute affections, the failure is shown by the irregularity of the pulse, while the force is little altered. In other cases (especially in cerebral diseases), the heart, before finally ceasing to beat, contracts violently, and suddenly stops.

The respiration is sometimes hurried and panting till just before D., while in other cases it is slow, laborious, and stertorous. The accumulation of mucus, etc., in the air-passages increases the difficulty of breathing; the sound known as the "death rattle" being produced by the passage of the air from the lungs through the fluid collected in the trachea and upper respiratory passages.

There is a loss of animal heat, beginning at the extremities. For further information on this subject, we may refer to the article DEATH in *The Cyclopædia of Anatomy and Physiology*, from which we have borrowed some of the matter of the preceding paragraphs.

The *signs of actual D.* may be arranged under three heads: 1. Signs of the extinction of the vital functions; 2. Changes in the tissues; 3. Changes in the external appearance of the body.

1. The arrest of the circulation and respiration would at first sight appear to afford decisive evidence of D.; but these functions, as in the case of hybernating animals, may be reduced to so low a condition that it is by no means easy to decide whether or not they are completely annihilated. In cases of apparent drowning, these functions are frequently suspended and again restored; and cases like that of col. Townsend (see any standard work on medical jurisprudence) occasionally occur, in which the patient has the power of voluntarily suspending these functions for a considerable period.

The loss of irritability in the muscular fibers (a fact which may readily be ascertained by a galvanic current) is a sign of far greater importance than either the apparent stoppage of the circulation or of the respiration. The contractility of the skin is also lost after death. When a cut is made through the skin of a dead body, the edges of the wound collapse, while a similar lesion inflicted during life presents an open or gaping appearance.

2. Among the changes in the tissues, the *rigor mortis*, or rigidity of the muscles, which ensues at a varying period after D., is the most important. It may appear within half an hour after D., or may be delayed 20 or 30 hours, according to the nature of the disease; and its mean duration is from 24 to 36 hours. It commences in the neck and trunk, then appears in the lower, and lastly in the upper extremities, and disappears in the same order.

3. Various changes in the external appearance of the body have been regarded as indicative of D. by different writers; of these, the most important unquestionably is the altered color of the surface. Livid spots of various sizes may occur from local congestions during life; but the appearance of a green tint on the skin of the abdomen, accompanied by a separation of the epidermis, is a certain sign that life is extinct.

The discrimination of true from apparent D. is obviously not a matter of mere physiological interest. The case of Vesalius, the eminent anatomist, who opened an apparently dead body in which the exposed heart was seen to be still beating, is well known, as also that of the abbé Prevost, who, having been struck down by apoplexy, was regarded as dead, but recovered his consciousness under the scalpel, and died immediately afterwards; and a French author of the last century, Bruhier, in a work *On the Danger of Premature Interment*, collected 54 cases of persons buried alive, 4 of persons dissected while still living, 53 of persons who recovered without assistance after they were laid in their coffins, and 72 falsely considered dead.

DEATH, PUNISHMENT OF. See CAPITAL PUNISHMENT.

DEATH ADDER. See ADDER; VIPERIDÆ.

DEATH-BED, LAW OF, IN SCOTLAND. As the law stood till recently, if any man, whilst suffering from the disease of which he ultimately died, burdened or conveyed away his heritable estate, to the prejudice of his lawful heir, he was presumed to have so acted in consequence of his inability to resist importunity in the state of feebleness to which he was reduced, and his heir was entitled to reduce the deed. This rule belonged to the most ancient consuetudinary law of Scotland. As lord Stair suggests (1, 12, 34, and 4, 20, 38), it probably was intended as a protection to the dying and their lawful heirs against the notorious propensities of the priesthood; and was thus referable to the same principle as the prohibition to convey heritage by will. Two tests were fixed upon by the law as establishing the existence of that degree of vigor which is technically called *liege poustie* (supposed to be a corruption for *legitima potestate*)—viz., survivance for 60 days, and going unsupported to kirk or market, and conducting himself in the ordinary manner. It was decided that it is of no consequence though the object of the visit were neither to worship nor to buy and sell, but simply to evade the law of death-bed. If the individual was in a condition to take part in the service of the church, or in the trade of the market, that was sufficient. Extreme old age, accompanied by manifest indications of the approach of death, were held equivalent to

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disease. But the deed of the oldest or most infirm man, or of the man who was laboring under the most mortal sickness, was not reducible, if another disease had supervened, of which he died, or if he were killed by accident.

DEATH RATE. See VITAL STATISTICS.

DEATHS, REGISTRATION OF. See REGISTRATION.

DEATH'S-HEAD MOTH, *Acherontia atropos*, a species of Hawk-moth (q.v.), or lepidopterous insect of the family *sphingidæ*, not uncommon in some parts of England and of the continent of Europe, and very widely distributed over the world, being found in Africa, the Mauritius, and the East Indies. It measures almost 5 in. from tip to tip of the extended wings; is of a dark color, the body yellow with black markings, the thorax with pale markings which have some resemblance to a skull, and from which it derives its name; the upper wings mottled with brown, black, and yellow. The caterpillar is greenish-yellow, the back speckled with black, with transverse lines partly blue and partly white; and in countries where the potato is cultivated, is often to be found feeding on the leaves of that plant. This insect is most frequently seen flying about in autumn, and only in the mornings and evenings. It is remarkable for emitting a plaintive squeaking sound, which, with its dark color, and the skull-like mark on the thorax, has led to its being regarded with superstitious dislike, the sudden appearance of large numbers being popularly held ominous of evil; whilst, in the Mauritius, a notion prevails that it casts a dust from its wings which produces blindness in persons on whom it falls, and its entering an apartment is therefore regarded with dread. How the noise which it emits is produced is not satisfactorily known. If the insect is taken and confined in the hand, this sound is sent forth sharply and strongly. The D. H. M. is interesting upon still another account, as one of those insects which enter and plunder beehives, feeding upon the honey; and although apparently quite defenseless, it enjoys perfect impunity whilst ravaging the stores of creatures so well provided with formidable weapons, and generally so ready to use them against an intruder. No explanation of this fact has yet been found.

DEATH-WATCH, a ticking sound produced by certain insects, inmates of human dwellings, and which, being most readily heard in that stillness which attends times of sickness and anxiety, has become associated with superstitious notions and fears, being regarded as indicative of an approaching death in the house. The most common form of this very prevalent superstition is the belief that when the death-watch is heard, some member of the household will die within twelve months. The tickings of the death-watch were formerly attributed to species of wood-louse and of spider, and it is probable that they are not all produced by insects of the same kind; but the most common death-watch of Britain is a species of borer (q.v.), (*anobium tesselatum*). It is of a dusky or grayish-brown color, and about a quarter of an inch in length. It is generally in summer that its noise is heard, the number of raps, given in quick succession, varying from several to more than a hundred. These are repeated at uncertain intervals. The noise exactly resembles that made by beating with the nail upon a table; and when this is done, the insect is not unfrequently induced to reply to it. It is the perfect insect, not the larva, which produces this sound. It seems, indeed, to be a call by which the sexes are attracted to each other, and is produced by the insect's beating upon some hard substance with its head, in doing which it raises itself upon its hind-legs, and with the body somewhat inclined, beats its head with great force and agility against the substance on which it stands. One of them was seen by Mr. Stackhouse thus to beat upon a sedge-bottomed chair with such force that its strokes made little indentations in the outer coat of the sedge.

DE AUGMENTIIS SCIENTIARUM, a treatise by lord Bacon, which forms the opening chapter of his *Instauratio Magna;* and after the *Novum Organum*, his most important treatise.

DÉBÂCLE, a French word, meaning in that language the breaking up of the ice in a harbor or river, but introduced into English by geologists to express any sudden flood or water, which bears before it opposing obstacles, and leaves its path marked with confused and scattered fragments of rocks, stone, and other débris.

DEBATABLE LAND, a tract of land chiefly level and of a moory character, but now in course of improvement, on the western border of England and Scotland. This tract of country, situated between the Esk and Sark, was at one time claimed by both kingdoms, and hence its name. In 1542, "it was divided by royal commissioners, appointed by the two crowns. By their award, this land of contention was separated by a line drawn from e. to w. betwixt the two rivers. The upper half was adjudged to Scotland, and the more eastern part to England. Yet the Debatable Land continued long after to be the residence of the thieves and banditti to whom its dubious state had afforded a refuge.—The jest of James VI. is well known, who, when a favorite cow had found her way from London back to her native country of Fife, observed 'that nothing surprised him so much as her passing uninterrupted through the Debatable Land.'"—Scott's *Minstrelsy of the Scottish Border*. The Græmes, a troublesome clan of freebooters who inhabited the D. L., were transported to Ireland at the beginning of the 17th c., and prohibited from returning on pain of death. See BORDER.

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DEBATE is an exchange of opinions, differing from conversation in this, that the speakers succeed one another according to certain regulations, and that the subject is treated formally, and in general with a view to coming to some practical conclusion. The term is usually understood of the discussions of political representative bodies. The debates of the English parliament are divided into two stages. The first concerns the general principle of the measure, and is conducted with strict parliamentary formalities; when this is carried, the details are discussed in a committee of the whole house, when a less formal and more free interchange of opinions is admitted. Parliamentary debates are sometimes decried by men of absolute tendencies as useless, and even mischievous. How, it is said, can a couple of speeches, *pro* and *con*, produce a rational conviction on any subject; it is more likely that the judgment will be run away with by specious oratory. But this proceeds upon a false conception of the great object of public D., which, though it seldom influences the votes on the actual question, serves to justify the proceedings of public men to their constituents, and forms one of the chief aliments of public opinion and of the political life of a community.

DE BAY, MICHAEL. See BAJUS.

DEBENTURE, a certificate or instrument acknowleding indebtedness, issued by a public or private corportion for the purpose of securing the debt by making it a charge on the property of the corporation at a fixed rate of interest. In the United States the word is applied specifically to a certificate given by the government to an importer setting forth that he is entitled to payment of a certain "drawback" when he re-exports goods upon which duty has been paid. The cases when this debenture certificate may be given are regulated by United States statute. The time allowed for the holding of the goods for re-exportation is three years; as a rule the re-exportation must be in the original package; in some cases, as with wines and liquors, debenture certificates can be issued only when the goods have been allowed to remain in a government bonded warehouse. Usually the intention of re-exportation subject to drawback must be declared at the time of importation, but the privilege may be granted sometimes when this has not been done upon proper identification of the goods. As applied to certificates of indebtedness for money received by joint stock companies, the term debenture is equivalent to bond, and denotes an obligation so framed as to be easily capable of being bought and sold in the open market as an investment; when the bond is secured upon certain specific property it may be called a mortgage debenture. In England the instruments called in the United States railway bonds are known as debentures. Their issue is regulated by an act of parliament of 1863, and they are usually issued for the purpose of raising capital for the carrying on of a new undertaking. By the law the entire property of the corporation issuing the debentures is chargeable for the repayment of the money. Such evidences of debt take precedence over stock certificates, and the payment of interest upon them must be met before dividends are issued. English railway debentures are generally accompanied by interest-warrants which are similar in character to coupons of bonds and are payable to the holder. Debentures of this kind are readily salable and rank among the highest classes of security. In the event of non-payment of interest or principal the holder has the same privilege as any mortgagee; in this country such holders may demand the appointment of a receiver of the property, and if necessary the winding up of the affairs of the corporation. In the United States the term debenture bond has of late been commonly used to denote the certificate of indebtedness issued by various land investment companies; these receive the money of investors and reinvest it in mortgages on real estate, but, instead of giving to each investor a mortgage on a separate piece of property, they issue debenture bonds, which are a charge against the investment of the company taken as a whole; thus it is seen that every investor is as well secured as any other and could not lose his money except by a total collapse of the concern. The certificates have met with general favor among small investors, but in the opinion of many the business has been overdone, and bonds of this kind appear now to be regarded with less favor. Another special use of the term in the United States is for a bond or undertaking given by the general government, acknowledging that a certain sum is due to a creditor whose bill has been audited, and pledging the Government to eventually pay it.

DEBLAI', in fortification, is any hollow space or excavation in the ground made during the construction of fortifications or siege-works. The cavity itself is the D., while the earth taken from it is the *remblai*.

DEB'ORAH (Heb. signifies a *bee*), a Hebrew prophetess, the wife of Lapidoth, who lived in the time of the judges. She dwelt in Mt. Ephraim, and uttered her judicial oracles from her tent under the palm-tree between Bethel and Ramah. To deliver her land from the oppressive yoke of the Canaanites, under which it had groaned for 20 years, D. called to her aid Barak, son of Abinoam, probably a man of heroic temper. An army was raised among the tribes of Naphtali and Zebulon, and a battle took place in the plain of Esdraëlon, where the Canaanitish host was completely routed, and Sisera during his flight, as D. had predicted, was murdered by a woman. This victory secured to the Israelites a peace of 40 years' duration. The "Song of Deborah" (as it is generally called, though its composition is not ascribed to her in the book of Judges) is a choice fragment of primitive Hebrew poetry.

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DEBOUCH'ING, in military tactics or evolutions, is the marching out of a body of troops from a wood, defile, or other confined spot, into open ground.

DEBREC'ZIN, a large straggling t. of Eastern Hungary, situated in the midst of an extensive plain, about 120 m. e. of Pesth. Like many of the Hungarian towns, D. is a mere collection of villages, united on no particular plan. The houses for the most part are mean structures of not more than one story in height, and the streets, if such they can be called, being unpaved, are exceedingly dirty; in certain seasons of the year, planks are laid down to enable passengers to cross. Notwithstanding its generally squalid character, however, D. is possessed of some very handsome public buildings, including a town-hall, a Protestant college, with a staff of 24 professors and 2,000 students, and several churches, monasteries, and charitable institutions.

DEBT, in law, strictly speaking, a sum of money due upon a certain and expressed agreement. This obligation may be founded on simple contract, be contained in a sealed instrument, or be established by the judgment of a court. In this meaning a debt is a definite sum due, not merely a claim for damages. In some applications, however, the word has been much more broadly used, and it is probable that most courts would not confine it to the strict definition above given, unless required so to do by the context of a law or the special circumstances of the case. Thus, it has been held that a debt may be a certain sum of money promised to be paid in the future as well as a sum already actually due and payable; but if the sum be payable upon a contingency at a future time it cannot properly be called a debt. A few citations from leading cases decided by courts of last resort in several of the United States will give an idea of the way in which courts regard the meaning of the word debt in some special applications; in its more general sense debt is that due from one person to another, whether money, goods, or service; under the United States legal-tender statutes debt embraces any obligation by contract, expressed or implied, which may be discharged by money through the voluntary action of the party bound; under the legal-tender acts the word debt includes the obligation to pay the condition of a mortgage bond; under the section of the United States Constitution forbidding the States to make anything but gold or silver a tender in payment of debts, the word is held to include damages awarded for property taken by the states in virtue of the right of eminent domain; where a statute prohibits a city from increasing its indebtedness, it is held that for that city to give its corporate bonds for the future payment of valuable property would violate the prohibition; a bequest of "whatever debts" might be due the testator at the time of his death has been held to include money lying at his bankers; a tax is not of the nature of a debt, not being founded on contract or upon other expressed agreement, but being rather an impost laid by a government. Under the dual form of government in this country an important question in regard to debts was raised as to the provision of the United States Constitution forbidding the several States to pass laws impairing the validity of contracts. It was questioned whether an insolvency law adopted by a single State did not violate this provision, as it allowed a debt already existing to be canceled upon the debtor's complying with the regulations of the insolvency proceedings. It has been settled by the courts that the States have the right to legislate in this manner, but subject to the power of the United States to adopt, if it choose, a uniform law of bankruptcy. Of course a State's insolvency law cannot impair as to debt the obligation of a contract existing before its passage. But in all contracts implying a debt entered into after its passage, it will be presumed that parties to the contract have in mind the provisions of the insolvency law. Such a law, however, will not apply to a contract of debt made between two persons, one of whom resides within the State which has passed the law, and the other in a State where no such law exists. A number of definitions, most of which originated in the Roman or civil law, have been retained to some extent in regard to debts. Thus, an *active* debt is one due me, a *passive* debt is one I owe; a *hypothecate* debt, or *hypothecary*, is one which has the force of a lien on an estate; a *liquid* or *liquidated* debt is one which is due at once and without condition, and the amount of which has already been definitely ascertained; a *judgment* debt is one resting on the decree of a court; a *privileged* debt is one which is given precedence over other debts, as in cases of insolvency or in settling an estate; in the last class of debts the privileged character may result from the relation of the creditor (as where that creditor is the government, or a person to whom the provisions of an insolvency law allow such precedence), or from the nature of the debt, as when it is for funeral expenses. When a debt is due from two or more debtors they may be *joint* debtors or *several* debtors; in the first place, they owe the debt as a body and suit must be brought against them together; if one of them is left out of the action the other debtors may demand that his name be inserted; in the case of debtors bound severally, each one is liable legally for the entire amount of the debt, and may be sued without the joining of the others in the action—though generally he has the remedy of "contribution" in a court of equity to compel them to recoup him.

Considering the relation of debt historically, there has been a remarkable and interesting change in the way in which the law has regarded the desirability of stringently enforcing the obligation and of providing legal methods for the recovery of the debt. In ancient times the delinquent debtor was practically handed over to the tender mercies of his creditor; in Greece and Rome, under the Mosaic law, and in England under the Saxon rule, the debtor was made the actual slave of his creditor. A change followed under the feudal system, owing to the fact that the feudal idea required frequent military

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service, and imprisonment of the person for debt was not consistent with that theory. As the feudal system fell into disuse and the necessities of trade and commerce grew, there was again a change towards the harsh treatment of the debtor, and it is only within our own time that imprisonment for debt has been almost altogether abolished. The present tendency of legislation relating to the collection of debts is to afford an easy and simple procedure, so that undisputed debts may be adjudicated upon quickly, and as summarily as is consistent with the right of defense and of appeal. Where the element of fraud, false pretenses, or concealment of property enters into the question the courts still possess, both in England and the United States, power to restrain and under some conditions even to imprison the debtor. For a fuller exposition of these principles and of other matters relating to phases of the general subject of debt see ABSCONDING; ACTION OF DEBT; ATTACHMENT; CESSIO BONORUM; DEBT, ACTION OF; DEBTOR AND CREDITOR; DEBTORS, ABSCONDING; DEBTORS, IMPRISONMENT OF; DEBTS, RECOVERY OF; GARNISH: IMPRISONMENT; INSOLVENCY; SEQUESTRATION; TRUSTEE PROCESS.

DEBT, ACTION OF, a common law form of action which is retained in the practice of many of the United States. This action will lie to recover a specific sum of money due from one person to another. If only the amount be fixed and ascertained it does not matter whether the contract has been under seal or not, or whether it be expressed or implied—in either case the action of debt will lie. When, however, the contract is under seal, the plaintiff may usually choose between the action of debt and the action of covenant; where it is not under seal the action may be either that of debt or of *assumpsit*. This form of action may also be brought to recover sums of money due upon judgments and records. The action must be brought within six years of the breach of contract if it be unsealed; within twenty years in cases of sealed contract. It is the special character of this form of action that it must be brought for the recovery of a sum certain or one which may be made certain by computation. In an action for debt, when the obligation is founded on a simple contract, the declaration must set out the considerations of the contract; when the obligation is founded on a "specialty"—that is, a sealed instrument—the specialty must be included in the declaration; when the obligation rests on a record, that must be set out. In the last two cases it is not necessary to aver the consideration. The pleadings proper to be made in reply to the declaration are: "no debt," in case of simple contract; "not true," in an action founded on a specialty; "not on record," in a case based on a record. In several of the United States where procedure codes have been adopted (in New York State, for example), as only one form of action in civil cases is allowed, the old form of action for debt is necessarily abolished.

DEBT, NATIONAL. A National Debt is the amount of money that any state acknowledges itself to owe to such persons as may have loaned money to the government whenever its ordinary income has been insufficient to meet its expenditure. When a deficit occurs in a budget, from some unforeseen event, as a war, a dearth, or an excess of expenditure, or from any cause, states have recourse to borrowing. The budgets of future years are often burdened with the interest and sinking fund for these loans. The general public do not understand the disastrous economic effects of loans, and many statesmen have been found ready to repeat Voltaire's famous dictum: "A state which is indebted only to its own citizens is in no way impoverished, but its debts are actually a fresh encouragement to industry." Others have insisted upon the advantages of a national debt from the moral standpoint, claiming that the existence of a heavy financial burden makes a nation more conservative in its diplomacy, less ready to engage in war, and more careful of its ordinary expenditure. In our own country this view at one time even found expression in a famous maxim: "A national debt is a national blessing."

This view is, however, repudiated by all professional economists and writers on government, who teach that a national debt does not in any sense differ in principle from a private debt, being equally burdensome, since it equally necessitates the withdrawal from use of some part of the general wealth.

The greatest national debts have generally been incurred by reason of some great war. That of Great Britain reached its present proportions in the struggle against France in the seventeenth, eighteenth, and nineteenth centuries; that of France, in the tremendous cost of the war with Germany (1870–71); that of Peru, in the disastrous war with Chile (1879); that of the United States in the great civil conflict of 1861–65. By reason of their debts, the Argentine Republic, Peru, Spain, Mexico, and Turkey, are never far from bankruptcy. Great Britain never expects to refund the principal of its debt, France will in all probability never be able to do so. As in the case of individual debtors who sometimes engage to pay more than they obtain from the lender, the amount of a national debt may not be the amount which the nation has borrowed; it is often greater, from the necessity of holding out to capitalists, as an inducement to make a large advance, that they will be set down as creditors for more than they have given. On the other hand, it may happen, though this is of rare occurrence on a large scale, that when money is bearing a low interest, a nation may give its creditors the alternative of receiving payment, or allowing a deduction from the nominal amount of their debt, and they may prefer the latter alternative.

We may now consider the two national debts that are historically the most interesting, and then summarize the present indebtedness of the principal nations of the world.

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English National Debt.—This arose historically along with the supremacy of parliament and the necessity for a standing army. Through the reigns of the Tudors and the Stuarts, the nation's protection against the power of the crown was the absence of a standing army, whose existence was regarded with great jealousy by the commons. But when the control of parliament over the prerogative was strengthened, jealousy in this direction was no longer necessary. Accordingly, it was when parliament triumphed in the revolution settlement that the national D. began. The first regular loan was obtained in 1693; it consisted of the capital of the newly created bank of England, amounting to £1,200,000. This accommodation to the government was, in fact, the price paid by the bank for its privileges. As the nation was engaged in an expensive war, this beginning was rapidly followed up, and at the peace of Ryswick, in 1697, the national D. exceeded 20 millions. Before the accession of the house of Hanover in 1714, it had exceeded 50 millions, and the rapid rise of this burden was a strong argument in the hands of the Jacobites against the revolutionary settlement. Whenever a loan was negotiated by the government, special terms were offered according to circumstances. In one case, there might be a terminable annuity, say of 60 or 100 years—that is to say, a certain percentage being paid during that period, at the end the D. was to be extinguished by such payments. See ANNUITY. In other instances, there was a perpetual annuity. In a loan negotiated on the latter terms, that annuity was always rather under than above what a borrower would give to a private lender, although such a borrower was bound to repay the money, while the nation was not. It came to pass, in fact, through one of the most curious processes in the whole mystery of finance, that a loan never to be repaid was considered a more eligible investment than a loan to be repaid. The government made this gain—for a distinct gain it was—by the convenience to the public, who, always having money for which they were glad to get the secure interest of the funds, were always ready with a new lender when the old one wanted to be paid. Hence has come the perpetual shifting of the fundholders. And as long as there are moneyed persons who will buy thus into the stocks without any considerable reduction, there is a sure test that the debt is not beyond the capacity of the nation. Raised, however, as we have seen, by special loans, each on its own conditions, the different funds became exceedingly varied and complicated. It was one of the projects of the great South sea schemers of 1720, to conjoin them all into one uniform fund, but this plan was interrupted by the failure of the whole affair. Afterwards, in 1751, a general uniform arrangement was carried out, and the stocks were then called the consolidated fund. See CONSOLS. Meanwhile, the progress of the national D. was in round numbers as follows: In 1756, when the war of the Austrian succession began, it was 75 millions; and seven years afterwards, when this war ended, it was 140 millions. Increased by the American war and the war with France and Spain, memorable by the defense of Gibraltar, it had increased to the amount of 260 millions when, in 1793, the great European war of the French revolution broke out. At the peace of Amiens in 1803, the D. was 620 millions. When the treaty of Vienna was resumed, after the battle of Waterloo, the amount had risen to 885 millions. It has since decreased, although some further loans have been incurred. The largest of these is connected with one of the most honorable actions of which the British empire, with all its traditions of glory, can boast—the advance of 20 millions, in 1834, for the emancipation of the colonial slaves. The latest considerable addition made to the national D. was during the Russian war of 1854, when 16 millions were raised by loan. In 1857, the amount of the D. was close to 812 millions, but till 1878 has steadily decreased. In that year the unfunded D. (owing to the war in the east and the inelasticity of the revenue) became nearly as large as in 1858. In 1884, the "funded debt" was £640,631,095; unfunded (exclusive of annuities), £14,110,600. The distinction between the two is, that the government do not profess to repay the former—they only give the creditor an annuity, terminable or perpetual, and if he wants payment of his money, he can only get it by selling his right to this annuity; the other consists of temporary loans, liable to fluctuation, and renewed from time to time.

It must be kept in view, however, that from a peculiarity of phraseology, the enormous amount of the national D. is partly fictitious, the whole sum neither having been borrowed nor being virtually due. When capitalists have advanced money, they have been content with a small percentage—3 or 3½—but they have often insisted that for each £100 advanced by them, they should have more than £100 of actual stock. If the condition of the market were such that the capitalist wanted 4½ per cent, and the interest or annuity obtained by him was only 3 per cent, he would insist on having stock to the extent of £150 for his £100. If 5 per cent interest were paid on the nominal amount of the national D., it would be a charge of more than 40 millions a year—the actual burden is between 26 and 27 millions. Such is, however, the reliance on the national credit, and the convenience of having the stocks for investment, that the stockholders are content with little more than 3 per cent interest, the right to an annuity of £3 being actually to be procured for somewhere about £90.

The literature of Great Britain has teemed with projects for getting rid of the incumbrance of the national debt, many of which go far wide of the mark, from the supposition that the debt is the incumbrance. In fact, the incumbrance is in the expenditure—the sacrifice of the nation's capital which has caused the debt—the debt itself is merely the shape in which that loss presses, and it must press in some shape. The millions

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have been exploded in powder and shot, and in other extravagances, and can never be recalled; all that can be done is, by industry and frugality, to make new millions, and replace the loss. Hence it is the supremest folly to suppose that any nation would profit by abolishing or wiping off the national debt—by repudiation, as it is called. Such an event would only be ruin to a large number of people who are in the position of being the nation's creditors, and would perhaps bring ill-gotten gain to a small number. It would be difficult to estimate precisely how such a calamity would act. In the first place, if it were seen to be in prospect, the funds would go rapidly down by the holders selling out, so that as long as the chances of stability would induce any one to buy at a very reduced price, the circle of sufferers would be, as it were, widening. The poorest of those interested would be the chief sufferers in the awful scramble. The working-classes, besides any savings which they might have directly invested in the funds, would lose about 40 millions, which they have invested through savings-banks and friendly societies. Widows and unmarried women with narrow fixed incomes would be the next sufferers. It is unnecessary to go further; for the general paralysis of capital and stoppage of manufacturing industry, along with loss of national reputation, would be incalculably disastrous. There is no way of reducing any national debt, except by saving up through taxation from the expenditure of the country. The process of reduction in this form is, however, always met by the consideration, whether the repeal of a disadvantageous tax, or the reduction of the interest of the D., is the better alternative. One thing is very clear, that from the progress of general wealth and increase of population, the national debt, assuming it to remain at its present amount, is always pressing with less and less severity on the country, and is therefore becoming more and more manageable. Some persons, looking at only one side of the matter, have gone the length of saying that, as a ready and safe means of investment, the national D. is a kind of blessing; though the slightest consideration would have shown, that it can never be advantageous for the community at large to be taxed to pay interest to a limited number of individuals. Whatever be the incidence of taxation to pay the interest, now amounting in the aggregate to about £27,000,000 per annum, it is the proud boast of England that she has ever kept faith with the national creditors—never, under all her embarrassments, repudiated a farthing of her debt. As a natural consequence, the British funds are sought as a secure means of investment by people of capital in all lands.

American National Debt.—The public debt of the United States was first reported, 1791, two years after the organization of the government, at $75,463,476.52. In 1812, at the commencement of the second war with England, it had fallen to $45,209,737.90. That war brought it up to a total of $127,334,933.74. After peace, the reduction was from $3,000,000, to $10,000,000 per year until in 1836 it reached its lowest point, being only $37,515.05. Thenceforward it increased one year and decreased the next, until in 1860, the year before the civil war, it was $64,842,287.88, and the annual interest was $3,443,687. This was a rate per capita on the whole population of $1.91 debt and 11 cts. interest. The most powerful opposition which ever rose against a modern government, made the raising of enormous sums of money an imperative necessity. Two small loans had been made just before; in 1858, $20,000,000 in 5 per cts., and in 1860, $21,000,000 in 6 per cts., the first to run 15, and the last 20 years. Of the last loan, only $7,022,000 was issued. Of the loans made necessary by the war of the secession, the first was Feb. 8, 1861, $25,000,000 at 6 per ct., to run 20 years, of which $18,415,000 was reissued. Mar. 2, 1861, six per ct. treasury notes were authorized, and $35,364,450 issued. Same date, $1,095,850 reissued to pay the Oregon war debt. July 17, 1861, $250,000,000, at 7 per ct., to run 20 years, with authority to issue any part in the form of treasury notes running three years at 7 3-10 per ct. interest, or on notes not bearing interest, but payable on demand, or in treasury certificates for one year bearing 3 65-100 per ct. interest; the whole amount of demand notes not to exceed $50,000,000. An act of Aug. 5, 1861, authorized the issue of 6 per ct. bonds, running 20 years, to exchange for the one and three year notes just mentioned, with accumulated interest, at any time before their maturity; and the demand notes were made receivable for all dues to the government. Before the close of the year, the demand notes, at first rejected by the banks, were at a premium, and the interest-bearing notes were readily convertible into permanent 6 per ct. bonds. Feb. 12, 1862, $10,000,000 more of demand notes were issued. In the same month the first great war loan was authorized—$500,000,000 of 6 per ct. bonds, redeemable after five and payable after 20 years. The loan was readily taken, and the full amount was issued. In 1864–65, $15,000,000 more was authorized of the same loan. In Feb., 1862, $150,000,000 of legal-tender notes were authorized, of which $50,000,000 were to take the place of demand notes. In July, 1862, $150,000,000 more were authorized; and an equal amount in addition in Mar. 1863; making $450,000,000 in all. Those issues formed the currency known as "greenbacks," from the color of the paper. An act in Feb., 1862, authorized the acceptance of $25,000,000 of deposits, increased in Mar. to $100,000,000, on which 5 per ct. interest was paid. In June, 1864, $50,000,000 more was authorized at 6 per cent. This was a temporary loan, to be repaid on ten days' notice, and was all redeemed before the close of 1866. In Mar., 1862, congress authorized the issue of certificates of indebtedness to public creditors in the adjustment of claims, running one year at 6 per cent. There

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were $561,753,241 issued, all redeemed before 1866. In July, 1862, postage-stamps were issued for currency, and made a legal tender for sums less than $5. In Mar., 1863, fractional currency was authorized in place of postage-stamps, the amount limited to $50,000,000. In Mar., 1863, a loan of $900,000,000 was authorized, principal and interest payable in coin; but only $75,000,000 was issued. The same act authorized $400,000,000 in one, two, and three year treasury notes, interest not over 6 per ct., payable in ordinary money, and to be a legal tender for their face value. The actual issues were: of one-year notes at 5 per ct., $44,520,000; two-year notes at 5 per ct., $166,480,000; three-year notes at 6 per ct., $266,595,440, making the whole issue $477,595,400; all canceled or exchanged before May 15, 1868. In Mar., 1864, a loan of $200,000,000 was authorized at 5 or 6 per ct., principal and interest payable in coin; $196,117,300 were issued at 5 per ct. to run 40 years (the 10-40s of 1864), and $3,882,500 at 6 per cent. Most of the 5 per cts. brought premiums from 1 to 7 per cent. In June, 1864, a loan of $400,000,000 was authorized at 6 per ct. (the 5-20s of 1864), of which $121,561,300 was issued. In June, 1864, congress authorized the issue of $200,000,000 in 7-30 treasury notes, and in Mar., 1865, the sum was increased to $600,000,000 more. The whole issue was $829,992,500 of 7-30 interest-bearing notes, and the whole loan was redeemed by the middle of July, 1868. In Mar., 1865, a loan was authorized of $600,000,000 in 6 per ct. 5-20 bonds, to be used only for the payment of treasury notes or other obligations of the nation. Two issues were made: July 1, $322,988,950; and Nov. 1, $203,327,250. Under the same act, an issue was made in July, 1867, of $379,616,050, and in July, 1868, $42,539,350, all to redeem treasury notes and other obligations; but in no case to increase the public debt. In Mar., 1867, and July, 1868, there were issued $85,150,000 of temporary loan certificates of deposit, bearing interest at 3 per ct., to redeem compound-interest notes. In July, 1870, the great refunding act was passed. The secretary of the treasury was authorized to issue $200,000,000 at 5 per ct.; $300,000,000 at 4½ per ct.; and $1,000,000,000 at 4 per ct. of 30-year bonds, principal and interest payable in coin, to be used only to redeem the 6 per ct. or other early bonds. Besides these issues, there were guarantee bonds issued to the Pacific and other railroads, secured by mortgage on the roads. In Jan., 1871, the 5 per ct. bonds were increased to $500,000,000.

These enormous financial transactions have no parallel for extent in the world's history. Yet for a time there was much fear that such loans could not be floated; but when they were proved possible without recourse to the capitalists of foreign countries, the loyal people of the union had abundant cause for congratulation. The loan of 1862, $515,000,000, was the greatest in amount and the most successful thus far attempted. Afterwards, however, loans were not easily made, and the government was compelled to resort to currency and treasury notes, and also compound-interest notes, and certificates of indebtedness. The greatest test of the financial strength of the nation fiercely struggling to maintain its political existence, was in 1864. On the 11th of July, in that year, gold touched its highest point, $2.85; and a paper dollar was worth in gold only about 38 cents.

The following is a statement of outstanding principal of the public debt of the United States on January 1 of each year from 1791 to 1842, inclusive; and on July 1 of each year, from 1843 to 1886, inclusive, and December 1, 1887, 1888, 1889, and 1890:

1791	Jan. 1	$75,463,476.52	1825	Jan. 1	$73,782,432.71	1859	July 1	$58,496,837.88
1792	"	77,217,924.66	1826	"	81,054,059.99	1860	"	64,842,287.88
1793	"	80,352,634.04	1827	"	73,987,357.20	1861	"	90,580,873.72
1794	"	78,427,404.77	1828	"	67,475,043.87	1862	"	524,176,412.13
1795	"	80,747,587.39	1829	"	58,421,413.67	1863	"	1,119,772,138.63
1796	"	83,762,172.07	1830	"	48,565,406.50	1864	"	1,815,784,370.57
1797	"	82,064,479.33	1831	"	39,123,191.68	1865	"	2,680,647,869.74
1798	"	79,228,529.12	1832	"	24,322,235.18	1866	"	2,773,236,173.69
1799	"	78,408,669.77	1833	"	7,001,698.83	1867	"	2,678,126,103.87
1800	"	82,976,294.35	1834	"	4,760,082.08	1868	"	2,611,687,851.19
1801	"	83,038,050.80	1835	"	37,513.05	1869	"	2,588,452,213.94
1802	"	86,712,632.25	1836	"	336,957.83	1870	"	2,480,672,427.81
1803	"	77,054,686.30	1837	"	3,308,124.07	1871	"	2,353,211,332.32
1804	"	86,427,120.88	1838	"	10,434,221.14	1872	"	2,253,251,328.78
1805	"	82,312,150.50	1839	"	3,573,343.82	1873	"	2,234,482,993.20
1806	"	75,723,270.66	1840	"	5,250,875.54	1874	"	2,251,690,468.43
1807	"	69,218,398.64	1841	"	13,594,480.73	1875	"	2,232,284,531.95
1808	"	65,196,317.97	1842	"	20,601,226.28	1876	"	2,180,395,067.15
1809	"	57,023,192.09	1843	July 1	32,742,922.00	1877	"	2,205,301,392.10
1810	"	53,173,217.52	1844	"	23,461,652.50	1878	"	2,256,205,892.53
1811	"	48,005,587.76	1845	"	15,925,303.01	1879	"	2,349,567,238.04
1812	"	45,209,737.90	1846	"	15,550,202.97	1880	"	2,128,791,054.63
1813	"	55,962,827.57	1847	"	38,826,534.77	1881	"	2,077,389,253.88
1814	"	81,487,846.24	1848	"	47,044,862.23	1882	"	1,986,688,675.05
1815	"	99,833,660.15	1849	"	63,061,858.69	1883	"	1,892,547,412.07
1816	"	127,334,933.74	1850	"	63,452,773.55	1884	"	1,838,904,607.57
1817	"	123,491,965.16	1851	"	68,304,796.02	1885	"	1,872,340,567.14
1818		103,466,633.83	1852	"	66,199,341.71	1886	"	1,783,436,697.73
1819	"	95,529,648.28	1853	"	59,803,117.70	1887	Dec. 1	1,664,461,536.38
1820	"	91,015,566.15	1854	"	42,242,222.42	1888	"	1,650,917,706.23
1821	"	89,987,427.66	1855	"	35,586,856.56	1889	"	1,617,373,419.53
1822	"	93,546,676.98	1856	"	31,972,537.90	1890	"	1,549,906,126.48
1823	"	90,875,877.28	1857	"	28,699,831.85			
1824	"	90,269,777.77	1858	"	44,911,881.03			

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NATIONAL DEBT OF GREAT BRITAIN.

	Principal.	Annual Charge.
Debt at the Revolution in 1688	£664,263	£39,835
Debt at Accession of Queen Anne, 1702	16,394,702	1,310,852
Debt at Accession of George I., 1714	54,145,363	3,351,268
Debt at Accession of George II., 1727	52,092,238	2,217,461
Debt in 1762 (George III., 1760)	128,865,430	4,851,961
Debt at beginning of American War	128,548,635	4,471,481
Debt at conclusion of American War, 1784	249,851,628	9,559,817
Debt at Accession of George IV., 1820	794,980,481	29,789 658
Debt at Accession of Queen Victoria, 1837	761,422,570	28,533,192
Debt, April 5, 1890	689,944,027	25,000,000
Debt, 1896	648,474,143	

NATIONAL DEBTS OF NATIONS.

Argentine Republic	$611,415,880	France	*$6,427,500,000	Portugal	$490,493,592
Australian Colonies	787,692,605	Germany	307,500,000	Roumania	171,292,560
Austria-Hungary	2,322,658,340	German States	1,827,977,750	Russia	3,731,103,600
Austria	1,615,190,165	Great Britain	3,449,720,135	Servia	62,550,000
Hungary	657,468,075	Greece	91,618,340	Siam	No debt.
Belgium	422,464,275	Hawaii	1,936,500	Spain	1,299,500,000
Bolivia	6,500.000	India, British	928,355.780	Sweden	66.412.279
Brazil	598,658,310	Italy	4,362,800,000	Switzerland	7,543,273
Canada	286,112,295	Japan	349,108.517	Turkey	900,000,000
Chili	80.568,887	Mexico	203,244,300	United States	1,549,296,126
China	38.500,000	Netherlands	452,000,000	Uruguay	72,205,722
Colombia	29,163,480	Norway	37,596,079	Venezuela	20,556,260
Denmark	54,369,325	Paraguay	5,151,891		
Ecuador	13,738,490	Persia	No debt.	Total	$35,040,265,637
Egypt	518,625,840	Peru	367,226,890		

* Thus it will be seen that France has the largest debt of any nation in the world. It is probably even larger than the figures indicated above would show, for M. Tirard, the late Prime Minister of France, has estimated that the engagements of the French Treasury, the redemption of which is obligatory at a date not later than 1960, amount to $7,174,907,310.

The debt of the German Empire is the Federal debt alone, exclusive of the debts of the several German States, which amounted in 1887 to $1,813,623,148. Though the amount per head of debt is larger in France, the Netherlands, and Portugal, yet the country of Peru is actually in a worse financial position than any other on the list; it would take more than 41 years of its revenue to pay off the debt, while it owes for unpaid interest the sum of $111,926,768. Of European countries, the least burdened with debt is Switzerland, as hardly 6 months of revenue would suffice to discharge its liabilities; it, moreover, possesses assets amounting to $13,785,393. Persia is the only recognized country in the world which has no public debt.

If to the debt of Great Britain we add the debts of the various United Colonies, the total reading the sum of $5,546,405,200 as the debt of the entire British empire. The reduction in the debt of Great Britain for the year 1889 was $34,769,909.

In order to avoid the necessity of borrowing, some states both in ancient and modern times have set apart a special hoard to be used only in great emergencies. Thus the Athenians had laid by a sum equivalent to $10,000,000 as a war fund at the beginning of the Peloponnesian war. In Rome a great reserve fund was kept in the temple of Saturn. Frederick the Great of Prussia found such a reserve in the treasury on his accession to the throne. Henry VII. of England left a large reserve fund to his son Henry VIII. The only contemporaneous instance of the kind is in the present German empire, which has a "war fund" estimated at 120,000,000 marks ($30,000,000) in gold, hoarded at the strong fortress of Spandau, near Berlin.

DEBTOR AND CREDITOR, LAWS OF. In the history of this, as of almost every other branch of jurisprudence, we may, if we will, trace the march of social progress in general. In the earlier stages of life in the state, the arrangements for borrowing and lending are rarely such as to enable the citizens to avail themselves with security of their mutual resources, or to assign such limits to the powers of the creditor as either the claims of humanity or his own true interests demand. On the one hand, lending is confounded with alms-giving; and the exaction of interest, and even of capital, is regarded as an act of inhumanity towards the poor. On the other hand, no sooner do the creditor's rights come to be recognized in anything like a legal sense, than there seem to be no logical grounds on which any limits can be set to them. If he is entitled to exact the debt at all, he is entitled to seize the goods of the debtor; and if the debtor has no goods, he is entitled to his services. But the possession of his services implies the possession of his person; and the possession of his person implies the possession of his life. Moreover, from the exaggerated notions of the domestic ties which usually prevail in early times, the person of the individual, where that individual is the father of a family, brings along with it that of his wife, his children, and his slaves. The

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creditor thus becomes the absolute master of the life and liberty of his debtor, and of all those who are dependent upon him. The arrangements of the Mosaic law are an illustration of the manner in which, in the ruder forms of society, the laws of debt thus combine a degree of lenity with a degree of severity which are equally alien to modern views. In this as in many other respects, they are, as Michaelis has pointed out (vol. ii. p. 300), a recognition of the consuetudinary law of the stage of society to which they belonged, rather than a system special to the Jews. If an Israelite became poor, it was a duty to lend to him, and no interest was to be exacted either in money or in produce. If he was a foreigner, the case was different, and the taking of interest was legal (Exod. xxii. 25; Deut. xxiii. 19, 20; Lev. xxv. 35–38). When the Sabbatical year arrived—i.e., at the end of every seven years—there was a general remission of debts as between Israelite and Israelite; and the near approach of the year of remission was not to be recognized as an apology for declining to lend to an indigent brother (Deut. xv. 1–11). Pledges, it is true, might be taken, but even here the same humane principles prevailed. The upper millstone was sacred, for to take it would be to deprive the debtor of the means of subsistence. If raiment was the pledge, it must be returned before nightfall, when it might be required for a covering; and the widow's garment could not be taken in pledge (Exod. xxii. 26, 27). In strange contrast to this is the provision (Lev. xxv. 39) that a poor Israelite may be sold to one possessed of substance, even when modified by the special provision that he shall serve as a hired servant, not as a bond-servant, and shall be set at liberty when the year of jubilee arrived. Michaelis says that the judicial procedure for debt was quite summary, the most important causes being decided probably in a single quarter of an hour; and he remarks that Moses nowhere thinks it necessary to mention how a debt was to be proved before a judge. There was, however, an extensive system of appeal; from the judge over 10, the case was carried to the judges over 50, 100, and 1000, and finally to Moses himself. As every Israelite was entitled to claim the land of his fathers at the jubilee year, and thus to place matters on the footing on which they were after the settlement in Palestine, debts and burdens on land were limited to claims to the fruits of forty-two harvests; but houses, with the exception of those of the Levites, might be sold in perpetuity (Lev. xxv. 29, 30, 32, 33). Children were often given in pledge (Job xxiv. 9), and ultimately into slavery, in payment of debt (2d Kings iv. 1). Subsequent to the captivity, the pressure of debts upon the poor became so intolerable, that Nehemiah espoused their cause, and insisted on a general remission (Nehem. v.), exacting from the rich an oath that they would never afterwards press for payment. Debts of the character here alluded to probably resembled those which the recipients of parochial relief in our own day owe to the community, rather than debts in the commercial sense. In Matt. xviii., Christ refers to the custom of selling the debtor, his wife and children, and all that he had, in payment, rather as a general custom of all nations, than as one peculiar to the Jews—the "certain king" being a typical instance of a man of substance.

Both in Greece (Plut. Vita Solonis 15) and in Rome (A. Gell. xx. 1, 19; Liv. ii. 23) the creditor had a claim to the person of the debtor. Previous to the time of Solon, this arrangement had produced consequences at Athens closely analogous to those which afterwards led to the struggles between the patricians and plebeians at Rome; and his abolition of it forms one of Solon's many claims to the character of an enlightened legislator. By the Twelve Tables, it was enacted at Rome that if the debtor admitted the debt, or had had judgment pronounced against him for it, thirty days should be allowed him for payment. At the expiration of that period, he was liable to be given into the hands of his creditor, who kept him sixty days in chains, exposing him from time to time publicly, and proclaiming his debt. If no one stepped in to release him, the debtor at the end of that time might be sold for a slave, or put to death. If there were several creditors, the letter of the law permitted them to cut their debtor in pieces, sharing him in proportion to their claims; but Gellius tells us that no Shylock ever was found at Rome. To treat him as a slave, however, and make him work out the debt, was the common practice; and the children in his power, in accordance with the whole constitution of society at Rome, followed his condition. The lex Pœtelia (326 B.C.) alleviated the condition of the debtors (*nexi*) to the extent, at least, of preventing summary imprisonment, and relieving all debtors, for the future, from being put in chains. There do not seem to have been any public prisons for debtors at Rome, and each creditor, consequently, was the jailer of his own debtor. In this circumstance we probably see the reason of the prominence which was given by the plebeians to a change in the laws of debtor and creditor, on the occasion of their first secession, in 494 B.C.; and subsequently during the whole course of the struggles between the two orders. Whatever we may think of the policy of limiting the rate of interest, as was afterwards done by the laws of Licinius, and had previously been done by those of Solon at Athens, there can be but one opinion in modern times as to the propriety of abolishing the right of private imprisonment.

During the feudal period, the person in general was not attachable for debt, imprisonment being inconsistent with the duties of warlike service, to which every man was bound; and it was for the encouragement of commerce, and in consideration of the merchant having to deal with strangers and foreigners, that it was first introduced by the mercantile communities of Europe (Bell's *Commentaries*, Shaw's ed. ii. p. 1067). By

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the statute of merchants, it was enacted, at Acton Burnel, in 1282, that in lending money, a merchant might bring the borrower before the lord mayor of London, or the chief warden of another good town, and cause him to acknowledge his debt and day of payment. A recognizance was then enrolled, and an obligation written by the clerk, and sealed with the king's seal and the debtor's. Failing payment, the creditor was entitled to produce this obligation, and to demand a warrant to seize the person of his debtor, and to commit him to the Tower. The history of the law of imprisonment for debt in this country is stated with great clearness by Mr. Bell in the section of his *Commentaries* to which we have just referred, but it is impossible to condense it within the limits of the present article. See also ATTACHMENT; DEBTORS, ABSCONDING; DEBTORS, IMPRISONMENT OF; EXECUTION ON CIVIL PROCESS; IMPRISONMENT; INSOLVENCY; SANCTUARY. Generally, it may be stated here, that up to the passing of the later bankrupt acts, the prisons of this country were crowded with debtors. It was ascertained by parliamentary returns, that in the 18 months subsequent to the commercial panic of 1825, 101,000 writs for debt were issued from the English courts. In the year ending 5th Jan., 1830, there were 7,114 debtors sent to prison in London, and on that day 1545 of these were still in confinement. The returns for 1880, which do not distinguish between debtors and other civil prisoners, are as follows: The number of debtors and others under civil process in prison was for England and Wales, 7771. In the United States, debtors find relief under insolvency laws, besides that afforded by a national bankrupt law when such is in existence. The laws vary somewhat. In California, Maryland, Minnesota, New York, and Wisconsin, an insolvent debtor may be discharged upon petition and upon making an assignment of all his property (except certain articles necessary for the support of himself or his family) for the benefit of his creditors equally. The same benefits are secured: in Alabama, to one imprisoned on a judgment for not paying a fine; in Arkansas and Illinois, to one imprisoned or liable to be arrested; in Connecticut, to one owing $100; in Delaware, to a resident of the state for one year who is imprisoned, unless committed by the chancery court; in Georgia, to one who has not within a year lost money by gambling; in Massachusetts, to an inhabitant who owes more than $200; in Missouri, to one imprisoned for fines, costs, or breach of the peace; in North Carolina, to one imprisoned 20 days; in Ohio, to a resident of the state for two years, or of the county for six months, or in custody after 60 days; in Pennsylvania, to a resident of the state for six months, or who had been in jail three months, or is detained on civil process, held on bail prise, or not arrested; in Rhode Island, to an inhabitant for three years owing more than $100 (but the court may ignore the residence); in South Carolina, to one sued, or within one month after being in custody; in Texas, to a bankrupt citizen, males at 21, females at 18. In all states, some considerable property is reserved to the debtor for the support of himself and family. When debts are fraudulently contracted, or where payment is sought to be evaded by fraud, the perpetrators of the fraud are excluded from bankruptcy and insolvency laws. With regard to the arrest of debtors, the law of the state of New York has been followed by most of the states. In New York, imprisonment for debt, except in certain cases, was abolished in 1831. In the code adopted in 1849, arrest is prohibited in civil actions, except in certain specified cases, viz.: in actions for injury to the person or character, or for injury or wrongfully taking or detaining property; embezzlement by public officers, or persons acting in a private judiciary capacity; for misconduct in office, or in any professional employment; in actions to recover possession of personal property, where it is concealed or kept out of the reach of the sheriff; and where the defendant has been guilty of fraud in contracting the debt or in avoiding payment. Women are exempt from arrest in all cases except actions for willful injury to person, character, or property. See DEBTS, RECOVERY OF.

DEBTORS, ABSCONDING. The existing laws for the arrest of debtors absconding from England having been found insufficient, in consequence of the delay which was occasioned in obtaining the necessary process, the "act to facilitate the more speedy arrest of absconding debtors" (14 and 15 Vict. c. 52) was passed in 1851. The evil was felt chiefly by creditors residing at a distance from London, whose debtors were able to perpetrate frauds upon them by embarking for distant countries from various towns and seaports in England; and authority was given to county-court judges to issue warrants to arrest the debtors till judgment could be obtained, or the debtors found bail to meet any judgment likely to be obtained. But the legislature having since changed its views as to the general expediency of arresting and imprisoning persons for debt, the above act was repealed in 1869, and the debtors act, 32 and 33 Vict. c. 62, contains the only enactment now in force on this subject. By the 6th section, where the plaintiff in any action in a superior court of law proves, at any time before final judgment, by evidence on oath, to the satisfaction of a judge of one of those courts, that the plaintiff has good cause of action against the defendant to the amount of £50 or upwards, and that there is probable cause for believing that the defendant is about to quit England unless he be apprehended, and that the absence of the defendant from England will materially prejudice the plaintiff in the prosecution of his action, such judge may, in the prescribed manner, order such defendant to be arrested and imprisoned for a period not exceeding six months, unless and until he has sooner given the prescribed security, not exceeding the amount claimed in the action, that he will not go out of England without the leave of the court. But if the action is for a sum in the nature of a penalty, it shall not be

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necessary to prove that the absence of the defendant from England will prejudice the plaintiff.

Before the general abolishing of imprisonment for debt in England and in the United States, stringent laws were necessary, and were enacted to prevent the secret escape from the jurisdiction of the court of debtors against whom suits by their creditors were pending. With the change of policy in the law as regards this point, the prevalence of absconding has decreased and the importance of the subject from the legal point of view is lessened. Still many of the United States have laws known as absconding debtor acts, which permit the arrest of such a debtor under certain special circumstances, and which authorize the attachment of property left by him within the jurisdiction of the court; such acts also permit the service of a process against such an absconding debtor by publication in place of personal service. It has been ruled by many courts that there is a sound and important distinction between the words *removed* and *absond*, the latter including a distinct intention to defraud or injure creditors; thus, if a debtor change his residence without intentional concealment he will not be considered an absconder, even though his creditors and others in the place he leaves are unaware of his new residence. The present English statute governing the subject allows the plaintiff to make affidavit that his debtor is about to leave the country, and that such absence will materially prejudice the plaintiff's action, whereupon the court may in its discretion order the arrest of the defendant and his imprisonment for not more than six months, or until he has given good security for the sum involved.

DEBTORS, IMPRISONMENT OF. American law now seldom allows imprisonment for debt in any of the United States. In New York, an act for its abolition was passed in 1831. Its main provisions are that no person shall be imprisoned in civil service, at law or in execution in equity founded on contracts, except in the following cases: In actions for fines and penalties, or on promises to marry, or for moneys collected by any public officer, and in actions for any misconduct or neglect in office, or in any professional employment. Moreover, in cases of debt claimed in any suit or founded upon any judgment or decree of a court of record, the defendant may be arrested upon an affidavit of the plaintiff stating the sum due to be more than $50, and charging the commission of certain fraudulent acts; as, that the defendant is about to remove any of his property out of the jurisdiction of the court to defraud his creditors, that he fraudulently conceals property, or has assigned, removed, or disposed of it with like intent, or that the debt was fraudulently contracted. The defendant is thereupon committed to prison, unless he pay the debt and costs of the suit or give security to pay them within a certain time, or unless he make an assignment of his property for the benefit of his creditors, or give security that he will make such an assignment, or that he will not dispose of any of his property until the demands against him are satisfied. If he make such an assignment of his property, there are provisions in the act by which he may be discharged from his indebtedness. Further provisions of an analogous nature to those contained in this act were embodied in the New York code, adopted 1848. The debtor may be arrested and imprisoned either on mesne or on final process. The principal grounds of arrest are, with few exceptions, the same as those enumerated in the previous act. The defendant, when arrested upon mesne process, may be admitted to bail. The imprisonment upon final process is for the same causes, and is applicable when the execution against the debtor's property has been returned unsatisfied, in whole or in part. The most important difference between these provisions and those of the earlier statute is that, in the recent act, means are provided only for securing the payment of the debt of an individual creditor, and there is no assignment provided for in behalf of all the creditors, or any means afforded of obtaining a discharge of the debtor from all his obligations. A large number of the states have adopted similar statutes.

DEBTS, RECOVERY OF, in the United States is ordinarily by an action at law. Such action lies where even the sum due is certain or ascertained in such a manner as to be readily reduced to a certainty, without regard to the manner in which the obligation was incurred or is evidenced. It is thus distinguished from *assumpsit*, which lies as well where the sum due is uncertain as where it is certain, and from *covenant*, which lies only upon contracts evidenced in a certain manner. It is said to lie in the *debet* and *detinet*. Debt in the *detinet* for goods differs from detinue, because it is not essential in this action, as in detinue, that the specific property in the goods should have been vested in the plaintiff at the time the action is brought. The declaration, when the action is founded on a record, need not aver consideration. When it is founded on a specialty, it must contain the specialty, but need not aver the consideration; but when the action is for rent the deed must be declared on. When it is founded on a simple contract, the consideration must be averred; and a liability or agreement, though not necessarily an express promise to pay, must be stated. The plea of "no debt" is the general issue upon the action on a simple contract, on statutes, or where a specialty is matter of inducement merely. "It is not true," is the common plea when on specialty, denying the execution of the instrument; and "not on record," when denying the existence of the record. The judgment is, generally, when for the plaintiff, that the plaintiff receive his debt and costs; and when for the defendant, that the defendant receive his debt and costs. A judgment in an action for the recovery of a debt itself

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constitutes a new debt, on which another action may be brought, unless there be some statutory restriction, as there is in some of the states. Under the codes of procedure in some states the technical action for debt no longer exists, as there is but one civil action.

DEBTS, SMALL. See SMALL DEBTS.

DEBURE, GUILLAUME FRANÇOIS, was born in Paris, France, in 1731, and died in 1782. He was a prominent bookseller and bibliographer, publishing *Bibliographie Instructive* (7 vols., 1763–68), noted for being the most important work on rare books published up to that time.

DEBUT (*début*), a French word which has been adopted into the English language, and signifies generally a beginning, or entrance, but is specially applied to the first appearance of an actor or actress on the stage at all, or to a first appearance in a particular theater. In these circumstances, the actor is called a *débutant;* the actress, a *débutante.*

DEC'A, Gr. signifying "ten," is of frequent occurrence in composition; as in *decapolis,* a union of ten cities; *decalogue,* the ten commandments; *decamètre,* a measure of ten mètres, etc. From *deca* is formed

DE'CADE, a collection or group of ten. As applied to time, decade was used in the calendar of the French republic to designate their week of ten days. Each month, of 30 days, was divided into three decades. The days of each decade were named *primidi, duodi, tridi, quartidi, quintidi, sextidi, septidi, octidi, nonidi,* and *decadi.* The tenth, or *decadi,* was the day of rest; and, as the republic acknowledged no definite religion, was devoted to the practice of and exhortation to virtue. The republican year numbered 36 decades, and had thus only 360 days. The remaining five (in leap years, six) were devoted as holidays at the end of the year without being numbered.

DEC'ACHORD, a kind of guitar with ten strings, similar to the common guitar, only larger in the body, and with a broader finger-board. The lower strings have no frets, being only used as open notes.

DECA'DENCE (Fr.), a term used with reference to works of art belonging to a school which had passed the period of its highest excellence before they were produced. In Greece, art in all its forms reached its acme in the time of Pericles; and though there are many exquisite works which were produced at a later period, they all belong, more or less conspicuously, to the decadence of Greek art. In Rome, again, both art and literature culminated in the time of Augustus, and from that time we have a decadence; which soon becomes very obvious and rapid. The school of the *Renaissance,* again, came to perfection with Raphael; even the Caracci belong to its decadence; and the decline was continuous through the *rococo* of Louis Quinze, till art became almost extinct all over Europe. In the beginning of the reign of George IV., it probably reached as low a point in England as it ever attained in any civilized country; and it is only within the last 30 years that it has begun to revive. Let us hope that its decadence is far distant

DECADENTS, THE. See SYMBOLISM.

DE CAEN, CHARLES MATHIEU ISIDORE, 1769–1832, was a French general famous principally for his share in the victory in Hohenlinden in 1800. In 1802 he went to India as captain-general of the French possessions there, returning in 1811. For meritorious conduct, he was created count in 1813. In 1815 he was in command at Bordeaux in the army of Louis XVIII. When Napoleon returned from Elba he joined his army, for which he was excluded from the service a few months later.

DEC'AGON is a plane geometrical figure of ten sides. When the sides are equal, the figure is called a regular decagon. A decagon may be formed from a pentagon (q.v.), by forming any irregular triangles on its sides in such a way that no two of them shall have their sides in the same straight line. A regular decagon is got from a regular pentagon by describing a circle round the latter, bisecting the arcs between its angular points, and drawing lines joining the angular points to the points of section.

DECAISNËA, a genus of plants of the natural order *lardizubalaceæ,* nearly allied to *Stauntonia.* It contains only one known species, recently discovered, a native of the Himalaya mountains, where it grows at an elevation of 7,000 feet. It is a very remarkable plant, and the only one of its natural order which is not a climber. It sends up from the root several straight erect branches like walking-sticks, which bear spreading pinnated leaves, 2 ft. long, standing out horizontally. The flowers are unisexual, green, and in racemes. The fruit is yellow, resembles a short cucumber, being about 4 in. long, and 1 in. in diameter. It is full of a soft, milky pulp, and large black seeds. Two or three fruits grow together. The pulp is sweet and wholesome.

DECALOGUE (Gr. *dekalogos,* "ten discourses"), is the term usually applied by the Greek fathers to the law of the two "tables of testimony" given by God to Moses on Mount Sinai. These tables were made of stone, and the commandments inscribed thereon are said to have been "written by the finger of God." The commandments are not numerically divided in the Pentateuch, and it has been supposed by some that

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the number *ten* was chosen, because ten was considered the most perfect number. As, however, there *are* ten distinct injunctions, it is superfluous to allege any other reason for the division than the simple fact, that this is the correct enumeration. Philo-Judæus divides them into two *pentads*, the first ending with "honor thy father and mother," etc.; but the general opinion among Christians is, that the first table contained those which enjoin upon us our duty to God (comprising the first four), and the second, those which enjoin upon us our duty to our fellow-creatures (comprising the last six). The Talmudists make the introductory words, "I am the Lord thy God, who brought thee out of the land of Egypt, out of the house of bondage," to be the first commandment, and in consequence, to keep the number *ten*, are obliged to run the next two into one. But the words quoted obviously contain no *command* at all, but merely express the grand general reason why the Israelites should yield implicit obedience to the injunctions which follow. Hence Origen commences the D. with, "Thou shalt have no other gods before me." His division is that in use in the Greek, and in all the Protestant churches except the Lutheran; while from the writings of Philo and Josephus, it appears that such was also the received division of the Jewish church. The Masoretic division is that which is adhered to in the Roman Catholic and Lutheran churches. According to it, the first two commandments, that concerning the worship of God, and that concerning the worship of graven images, constitute but one. The number ten, however, is here also preserved by dividing the tenth into two, the first of which is made to be, "Thou shalt not covet thy neighbor's house," and the second, "Thou shalt not covet thy neighbor's wife, nor his man-servant," etc., to the end. There are two versions of the D. in the Pentateuch; the first is contained in Exodus xx., the second in Deuteronomy v. These are substantially and almost verbally the same, except in regard to the fourth commandment, for the observance of which the reason assigned in the former differs entirely from that in the latter.

DECAMERON, the title of a collection of stories written by Boccaccio, and supposed to have been told in successive nights by guests who were escaping from a plague then raging in Florence, about 1348.

DE CAMP, JOHN, b. N. J., 1812; midshipman, 1827; commander, 1855; after which he commanded the *Iroquois* in the attack on forts St. Philip and Jackson and at the siege of New Orleans in 1862; took part in various actions on the Mississippi; served with distinction in the war of the secession under Farragut, was made commodore in 1866, and was retired in 1870 with the rank of rear-admiral. He d. 1875.

DE CAMP, JOSEPH RODEFER, a painter of landscape and figures, was born in Cincinnati Nov. 5, 1858; studied in Munich under Frank Duveneck; elected to the Society of American Artists in 1888. Impressionism modified by a realistic treatment characterizes his paintings.

DECAMPS, ALEXANDRE-GABRIEL, a celebrated French painter, was b. at Paris in 1803. He was a pupil of M. Abel de Pujol, the well-known historical painter, but he seems not to have been very amenable to tuition. He was one of those who cannot be made to imitate approved models, and he soon began to strike out a style of his own, which was new to the public, and was long in becoming popular. About 1830, he made a tour in the east, which had a considerable effect upon the character of his works. For several years after his return he painted chiefly eastern subjects. Either the novelty of his subjects—eastern scenes and customs being then comparatively unfamiliar to Europeans—or the novelties of his manner, made the public hesitate in its verdict upon these works; while they were not unfrequently rejected by the jury at the academy of paintings. Gradually, however, they grew into favor; and the prices fetched by these and the other works of D. show that he is now among the most esteemed of the artists of his time. He painted landscapes, genre-pieces, and historical pictures; but though he has produced works in each of these kinds which are of the highest order of merit, his animal pictures are those which first attained to popularity among his countrymen. D. had a great deal of humor; and he loved to paint animals of all kinds. The monkey was his specialty; and a series of humorous pictures in which the monkey, or groups of monkeys, are introduced—now widely known by engravings or lithographs—were among his best and most popular works. In one of this series, *Les Singes Experts*, he managed to convey a stinging criticism upon the judges at the academy who were so slow to admit his merit as an artist. Undoubtedly, his execution had considerable faults, but they were closely associated with its merits. His drawing was often careless, and when some favorite effect was to be produced, he never hesitated to set perspective at defiance. The boldness of his coloring, and the startling light-effects introduced in his pictures, were what critics at first found most fault with. These are, however, the peculiarities of his manner, and now that they are no longer strange, they find not only apologists but admirers. If they were merits, they were of a kind which, in the hands of imitators, were very apt to degenerate into faults, and the French artists who have taken D. for their model, have, by their exaggerations, done not a little to imperil the reputation of their master. Successful as he was in animal painting, D. was much chagrined by the preference shown by the public for his genre over his historical pieces —which, by English critics at least, are now considered among the finest productions of the French school. Of his landscapes, and even of his historical works, the majority are taken from eastern subjects. It was perhaps a consequence of the tardy recognition

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given to him by critics and other authorities, that not more than one of his pictures is now in a public collection in France. His works are in private hands; but at the exposition universelle of 1855, sixty of them were brought together, and an opportunity was thus afforded of comparing them with the more accessible works of other contemporary painters. His pictures divided attention with those of Ingres, Delacroix, and Vernet, and received the award of a medal. D. was made a chevalier of the legion of honor in 1839, and was promoted to the grade of officer in 1851. He died at Fontainebleau on the 22d of Aug., 1860, of injuries which he sustained by falling from his horse.

DECANDOLLE, AUGUSTIN PYRAME, one of the most eminent of botanists, was born at Geneva, 4th Feb., 1778, and was descended from an ancient noble family of Provence, which was compelled to seek refuge in Geneva from religious persecution about 1558. His father was a syndic of Geneva, and had an estate near Yverdun, where much of D.'s boyhood was spent. He received his education in the gymnasium of Geneva, distinguished himself by his attainments in classical scholarship and his love of poetry, as well as by his delight in the study of history, to which and to the profession of law he proposed to devote himself. But after he had begun his studies for this profession, the union of Geneva with the French republic in 1798 made such a change in his prospects, that he thought proper to relinquish it for that of medicine; having also in the meantime learned to delight in the physical sciences, particularly chemistry and botany, to which the lectures of Vaucher at Geneva in 1796 very much contributed. From this time forth, these were the great pursuits of his life, and he never ceased to study and investigate the relations of these two sciences to each other. He went to Paris, where he prosecuted his studies, and where his botanical publications soon won for him a distinguished place among the scientific men of his time. A work on succulent plants (Par. 1799–1803), one of the species of *astragalus* (Par. 1802), and some less important works, were followed by his extremely valuable *Essai sur les Propriétés Médicales des Plantes* (Essay on the Medicinal Properties of Plants), (Par. 1804). In 1802, he was called to a professorship in the academy of Geneva, but preferred to remain in Paris, and delivered his first botanical lectures in the collége de France. In 1804, appeared the first volume of his *Flore Française*. Employed by the government, he visited all parts of France and of the kingdom of Italy in 1806–12, investigating their botany and agriculture; but the events of 1814 prevented the production of the great statistical work in which it was intended to embody the results of these investigations. On the fall of Napoleon, he was compelled to retreat to Geneva, where a professorship of botany was founded for him, and where he spent the remainder of his life. His *Théorie Elémentaire de Botanique* (Par. 1813) was followed by two other works, the fruits of his studies in systematic botany and the properties and natural affinities of plants, and by which the true knowledge of that science has been wonderfully promoted, his *Regni Vegetabilis Systema Naturale* (2 vols., Par. 1818–21), and his *Prodromus Systematis Naturalis Regni Vegetabilis* (vols. 1–10, Par. 1824–46). D.'s labors established on a surer basis, and improved in many of its most important respects, the natural system of botany which Jussieu had attempted to found. See BOTANY. The latter years of D.'s life were years of sickness and suffering, and he died of dropsy on 9th Sept., 1841. He bequeathed his collections—including a herbarium of more than 70,000 species of plants—to his son, ALPHONSE DECANDOLLE, on condition of his keeping them open to the public, and of his carrying on the *Prodromus*. The son (1806–93) accordingly devoted himself to this work, which he completed with the 17th volume. He also was a botanist of high repute, and author of several botanical works, among which are an *Introduction à la Botanique* (1835), and the *Géographie Botanique* (1855); also an *Histoire des Sciences* (1872).

DECAPITATION. See CAPITAL PUNISHMENT.

DECAPODA. See CRAB and CRUSTACEA.

DECAP'OLIS, a district of Palestine anciently containing, as its name implies, ten cities that were classed together not because of their geographical position, but because of their political resemblance. Soon after the Romans had conquered Syria (65 B.C.) they rebuilt ten cities, placed colonies in them, and endowed them with special privileges. Writers are not agreed concerning the names of all the ten, and it is probable that the original number was enlarged. Pliny names them as Damascus, Philadelphia, Raphana, Gadara, Hippo, Dion, Pella, Canatha, Galasa (Gerasa) on the e. of the Jordan, and Scythopolis on the west. At the time of Christ they were all prosperous and contained large numbers of Gentile inhabitants; but at present Damascus only retains its importance. Scythopolis, or Beth-Shean, anciently next in size, still exists as the village of Beisan: others are of interest only for their ruins, those of Gerasa being especially magnificent.

DECA'TUR, a co. in s.w. Georgia, on the Florida border; bounded w. by the Chattahoochee; reached by the Plant System railroad; 1106 sq. m.; pop. '90, 19,949, including colored. The soil is moderately fertile, producing corn, cotton, tobacco, rice, molasses, etc. Co. seat, Bainbridge.

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DECATUR, a co. in s.e. Indiana, intersected by the Grand Rapids and Indiana and other railroads; 380 sq. m.; pop. '90, 19,277. Co. seat, Greensburg.

DECATUR, a co. in s. Iowa, on the Missouri; 534 sq. m.; pop. '90, 15,643. It is a prairie region, and agriculture is the chief business. Co. seat, Leon.

DECATUR, a co. in n.w. Kansas; formed 1873; drained by Sappa creek; surface slightly rolling; 900 sq. m. Pop. '90, 8414. Co. seat, Oberlin.

DECATUR, a co. in s.w. Tennessee, on the Tennessee river; intersected by Beach river; 310 sq. m.; pop. '90, 8995, including colored. It is level, with fertile soil, producing corn, wheat, cotton, butter, tobacco, etc. Co. seat, Decaturville.

DECATUR, city and co. seat of Morgan co., Ala., on the south bank of the Tennessee river, about eighteen miles above the Muscle Shoals, and on the Louisville and Nashville, and Memphis and Charleston railroads, was founded in 1826, but has grown to importance since 1886. It has charcoal and iron furnaces, bridge and car works, and manufactures of lumber, sashes, and blinds, wooden ware, agricultural implements, leather, cotton, and ice, national bank and several weekly newspapers. Pop. '90, 2765.

DECATUR, a town and co. seat of De Kalb co. Ga.; on the Georgia railroad, 6 m. e. of Atlanta; pop. '90, 1013. The place is noted for fine climate and beautiful situation. It was here that the confederates under Hood fell upon the unionists under Thomas and Schofield in the hope of hindering the approach of Sherman to Atlanta in the famous "march to the sea." They failed, however, losing 5000 men; the loss on the Union side was 1500.

DECATUR, a city and co. seat of Macon co., Ill., on Sangamon river, very near the middle of the state, at the junction of several railroads; 38 m. from Springfield, and 169 from Chicago; pop. 1890, 16,841. It is a manufacturing city in an agricultural section, and, owing to its exceptional railway facilities, has large trade and shipping interests. It has national banks, libraries, daily, weekly, and monthly periodicals, electric lights, and electric street railway, numerous churches, etc.

DECATUR, STEPHEN, 1751–1808; b. R. I. He was early engaged in seafaring, and during the revolution had command of several privateers. In 1798 he became a capt. in the navy and was put in charge of the *Delaware*, 20 guns, with which he captured two French privateers. He was discharged from service, 1801.

DECATUR, STEPHEN, Jr., 1779–1820; b. Md., son of Capt. Stephen, and like him a seafarer, though in the regular navy. In Nov. 1803 he had command of the *Argus*, in Commodore Preble's squadron, and afterwards of the *Enterprise*. At this time he made a dash into the harbor of Tripoli and burnt the frigate *Philadelphia*, which had fallen into the hands of the Algerine enemy. In recognition of this act he was made capt., and presented with a sword. Decatur had much more hard fighting in the harbor and neighborhood of Tripoli, and in all cases showed the utmost daring and bravery. The war with Tripoli ended 1805, and from that time until the war with England, Decatur was in various duties of small importance. In 1812, he was in command of a squadron off the Atlantic coast, and Oct. 25, in the *United States*, captured the English frigate *Macedonian*. In May, 1813, he found himself blockaded in Long Island sound, and was forced to remain more than a year in the harbor of New London. In Jan., 1815, he attempted to escape from his blockade in the frigate *President*, but his ship struck on the bar at Sandy Hook, and, after a determined contest with four of the enemy's ships, he surrendered and was taken to Bermuda with his frigate as a prize. He was soon paroled, and in May, 1815, sailed from New York with three frigates, one sloop, and six brigs and schooners to operate against Algiers. He captured two important vessels; but the war was soon concluded by a treaty abolishing demand upon the United States for tribute, and giving up all prisoners. He made arrangements to the same effect with the rulers of Tunis and Tripoli, and thus put an end to the enslaving of the Americans by the corsairs of those countries. In Nov., 1815, he was made navy commissioner, holding the office until his death, which occurred in a duel with Commodore James Barron. His nephew, STEPHEN, 1815–76, was commodore in U. S. navy.

DECAZES, ÉLIE, Duc, 1780–1860; a French lawyer and statesman. He was secretary to Letitia Bonaparte, but went over to the Bourbons in 1814, and became prefect of police in Paris. In 1815, he was made minister of police; in 1818, minister of the interior; and in 1819, prime-minister. In 1820, he was appointed ambassador to England. He was a strong opponent to the extreme measures of the government.

DEC'CAN (Sans. *Dakshina*, the south), a term applied sometimes to the whole peninsula of Hindustan to the s. of the Vindhya mountains, which separate it from the basin of the Ganges, and sometimes restricted to that portion of the same which is rather vaguely bounded on the n. by the Nerbudda, which falls into the gulf of Cambay, and on the s. by the Kistna or Krishna, a tributary of the bay of Bengal.

DECEMBER, the last month of the year. In the old Roman calendar, before the time of Julius Cæsar, the year began with March, and that which is now the twelfth, was then the tenth month; hence the name (*decem*, ten). Our Saxon ancestors called it *Mid-winter-month* and *Yule-month*.

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DECEM'VIRI. The most famous body known under this title were the ten persons who were appointed as a sort of legislative committee, to draw up a code of laws at Rome. The groundwork on which the D. proceeded, was the information which had been previously collected by three commissioners who were sent for that purpose to Greece. On the return of the commissioners, after a year's absence, a violent dispute arose between the patricians and plebeians as to which of the orders should be intrusted with the revision of the laws. The dispute ended in favor of the patricians, and ten patrician lawgivers were consequently appointed, to whom, moreover, the whole government of the state was intrusted during the year for which they were to hold office. The experiment was eminently successful; the work of legislation was carried on with zeal and success, and the state was governed with prudence and moderation. Their labors not being quite finished, a new body of D. was appointed; only *one*, the notorious Appius Claudius, belonging to the previous commission. In their magisterial and executive capacities, the new D. acted in the most tyrannical manner. In place of the fasces alone being carried before the decemvir who presided for the day, as on the former occasion, each of the ten was now attended by twelve lictors, who carried not only the rods, but the axe which was the emblem of sovereign power. Every species of outrage was committed on the persons and families of the plebeians, and when the term of their appointment expired, the D. refused either to resign or to allow successors to be appointed to them. At length, the iniquitous decision of Appius Claudius (q.v.) in the matter of Virginia brought affairs to a climax. A popular insurrection broke forth, the D. were driven from their office, and the tribunes and other ordinary magistrates of the republic were reappointed. The occurrence is the subject of one of Macaulay's most spirited *Lays of Ancient Rome.*

DECEN'NARY. See TITHING.

DECEN'NIAL GAMES, celebrated in Rome once in ten years, commemorating the nominal refusal of Augustus to be emperor for life, and his preference for re-election once in ten years. They were kept up as a popular amusement until the last days of the empire.

DECEPTION ISLAND, near South Shetland, in the Antarctic ocean, is worthy of notice for the contrarieties which it presents. Under the reign of all but perpetual winter, it possesses hot springs and a volcano. In these contrasts it so far resembles Iceland with its Hecla and its geysers. But D. I. seems to be peculiar in this, that its very material consists of alternate layers of ashes and ice. It contains a deep lake of 5 m. in circuit.

DE CHARMS, RICHARD, 1796–1864; b. Philadelphia, author and clergyman. He was a Swedenborgian pastor in Cincinnati, Philadelphia, and Baltimore. He established the *New Jerusalem Magazine*, the first three numbers of which he set up in type and printed, having been a printer. He was editor of the *Precursor* and *The New Churchman*. His principal work is *The New Churchman Extra*, a treatise on polemics and church history.

DECID'UOUS TREES (Lat. *de*, and *cado*, falling off) are those which annually lose and renew their leaves. In cold and temperate countries, the fall of the leaf in autumn, and the restoration of verdure to the woods in spring, are among the most familiar phenomena of nature, connecting themselves also very intimately with the feelings, habits, and circumstances of mankind. The greater part of the trees and shrubs of temperate regions are deciduous; but within the tropics, the forest retains always its luxuriance of foliage, except in countries where the diversities of condition, occasioned by the wet and dry seasons, are extreme, and there many trees lose their leaves in the dry season, from causes apparently the same with those which produce the same effect on the approach of winter in colder countries, and which are connected with a sort of rest of the plant, or partial suspension of the active functions of vegetable life. Trees not deciduous are called evergreen (q.v.).

DECIMAL FRACTIONS (Lat. *decem*, ten) are such as have for their denominator any of the numbers 10, 100, 1000, etc., i.e., any power of 10. See FRACTION. Thus, $\frac{7}{10}$, $\frac{23}{1000}$, $\frac{19}{1000}$, are decimal fractions. In writing such fractions, the denominator is omitted, and the above stand thus: 0.7, or .7, .23, .019. That these numbers do not express integers is intimated by the point to the left; and the denominator is always 1, with as many ciphers annexed as there are figures in the decimal. A cipher is prefixed to 19, because otherwise it would read as if it stood for $\frac{19}{100}$. The expression £5.647 is read, five pounds and 647-thousandths of a pound; or, five pounds, and six-tenths, four-hundredths, and seven-thousandths of a pound. That these two readings are equivalent appears from this, that $\frac{647}{1000} = \frac{600}{1000} + \frac{40}{1000} + \frac{7}{1000} = \frac{6}{10} + \frac{4}{100} + \frac{7}{1000}$. It thus appears that the first figure of a decimal to the left expresses tenths of the unit; the second, hundredths; the third, thousandths, etc. In this property lies the great advantage of decimal fractions; they form merely a continuation of the system of notation for integers, and undergo the common operations of addition, multiplication, etc., exactly as integers do. To explain the principles which determine the position of the decimal point after these operations, belongs to a treatise on arithmetic.

The disadvantage attending decimal fractions is, that comparatively few fractional

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quantities or remainders can be exactly expressed by them; in other words, the greater number of common fractions cannot be *reduced*, as it is called, to decimal fractions, without leaving a remainder. Common fractions, such as $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{3}{5}$, $\frac{9}{25}$, for instance, can be reduced to decimal fractions only by multiplying the numerator and denominator of each by such a number as will convert the denominator into 10, or 100, 1000, etc. (The common process is merely an abridgment of this.) But that is possible only when the denominator divides 10, or 100, etc., without remainder. Thus, of the above denominators, 2 is contained in 10, 5 times; 4 in 100, 25 times; and 25 in 100, 4 times; therefore, $\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10} = .5$; $\frac{1}{4} = \frac{1 \times 25}{4 \times 25} = \frac{25}{100} = .25$; $\frac{9}{25} = \frac{9 \times 4}{25 \times 4} = \frac{36}{100} = .36$. But neither 3 nor 7 will divide 10 or any power of 10; and therefore these numbers cannot produce powers of 10 by multiplication. In such cases, we can only approximate to the value of the fraction. Thus, 10, 100, 1000, etc., divided by 3, give 3, 33, 333, with a remainder in each case; and $\frac{2}{3} = \frac{2 \times 333}{3 \times 333} = \frac{666}{999}$. As this denominator is nearly equal to 1000, $\frac{2}{3} = \frac{666}{1000}$, or .666 nearly. As 10, and therefore its powers, are composed of the two factors 2 and 5, it is obvious that any fraction whose denominator contains any other factor than these, cannot be reduced exactly to a decimal fraction.

DECIMAL NOTATION. See NOTATION.

DECIMAL SYSTEM. This name is applied to any system of weights, measures, money, etc., in which the standard unit is divided into tenths, hundredths, etc., for the denominations below it, and multiplied by 10, 100, etc., for those above it. The nature of this method of division will be best explained by an example from the French system, where it has been most rigidly carried out. The *meter* (= 39.37 English inches) is the unit of length, and the foundation of the whole system. For the higher denominations of length, the Greek words *déca*, *hecto*, *kilo*, and *myria*, are prefixed to signify *multiplying* by 10, 100, 1000, 10,000; so that *décameter* = 10 meters, *kilometer* = 1000 meters, etc. The Latin words *déci*, *centi*, *milli*, on the other hand, are used to express *division* by 10, 100, etc., and thus furnish names for the lower denominations; *décimeter* = $\frac{1}{10}$ of a meter, *centimeter* = $\frac{1}{100}$ of a meter, etc. Similarly with money; the *franc* being the unit, a *décime* is the tenth part of a franc; and a *centime*, the hundredth part.

Belgium and Switzerland have adopted both the French franc as the standard unit and the division into tenths. The Italian *lira* is the same as the franc. The decimal system in regard to money, with various units of reckoning, is now in use also in Germany, the Netherlands, Sweden, Russia, Austria, Spain, Portugal, Greece, Turkey, the United States, China, and Japan. The French metrical system of weights and measures has been introduced into Germany, Belgium, Switzerland, Spain, Portugal, etc.

This plan of decimal gradation in weights and measures is the only rational one, because it is in accordance with the universally adopted decimal notation. If thoroughly carried out, the facilities it would afford in every department of life are scarcely calculable. For one thing, it is not too much to say that one-half the time now spent in Great Britain in learning arithmetic might be saved. That study might, in addition, be made an effective means of intellectual discipline; whereas at present the time must be spent in acquiring something like a ready but blind application of complicated rules.

The most striking instance, perhaps, of the inconvenience of the arbitrary mode of division is furnished by the thermometer. In this case, nature has fixed the fundamental measure, and made it the same for all nations—the interval, namely, between the freezing and boiling points of water. And yet, in England, this space is divided into 180 parts or degrees; in Germany and the continent generally, into 80°; and only in France has it been divided into 100°. Thus, the basis of uniformity made to our hand has been thrown away, and every observation of temperature made in one country has to be painfully translated before it can be understood in another. See METER.

DECIMA'TION, a military punishment, rarely inflicted in the present day. When a considerable body of troops committed some grave military offense, which would be punished with death if committed by an individual, the punishment was awarded to one tenth of them by lot, instead of to the whole number, in order that the army might not be too much weakened.

DEC'IMI, in music, is an interval of ten diatonic degrees, as from C to E, or third above the octave, as which it is always treated in harmony. There are only two cases in which it is treated differently from the third: 1st, in double counterpoint, where a necessary difference must be made although the same harmonic rules apply; and 2d, in thorough-bass, where the figure 9 shall rise a degree to 10, instead of falling a degree to 8.

DE'CIUS, C. MESSIUS QUINTUS TRAJANUS, a Roman emperor, was b. at Bubalia, in Lower Pannonia, towards the close of the 2d c., and was the first of a line of monarchs who claimed descent from an Illyrian stock. Being sent in 249 A.D. by Philippus, the ruling emperor, to restore to subordination the army of Mœsia, which was in a state of revolt, the troops proclaimed him emperor against his will, and forced him to march upon Italy. Philippus encountered the forces of D. near Verona, but was defeated and

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stain. D. assumed the government of the empire in the end of the year 249 A.D., but his brief reign was one of restless warring with the Goths, fighting against whom he was killed near Abricium, in the close of the year 251. During the reign of D., it was determined to revive the censorship, and to persecute the Christians, in order by the first to check the growing immorality of the state, and by the second to bring back the purity of the Roman religion, and regain for Rome the favor of the gods. The censorship was never fully restored, but a barbarous persecution of the Christians took place. In Rome, Antioch, and Jerusalem, the several bishops were massacred; Origen, famous among the early fathers, was subjected to the most acute tortures; dreadful cruelties were also perpetrated at Alexandria. Many Christians, in Africa, disowned their religion, until the persecution had passed.

DE'CIUS MUS, PUBLIUS, father, son, and grandson, all Roman consuls and mythical heroes. It is told of the first two that before a battle which might be decisive they had visions simultaneous in time and import, that one of them must be devoted to the infernal gods. Instead of casting lots to decide which, they agreed that the infernal gods should have the man whose columns first wavered in the fight. The columns of Decius wavered first, and rushing upon the enemy in a spirit of self-immolation he perished. But a moment afterwards his men recovered and won the victory. Similar stories are told of the third, and of some others of the family.

DECK, is a nearly flat-planked covering to a ship, forming a flooring to the persons above it, and a shelter to those below it. There may be several such in a ship, one under another; not only does each serve the purposes here named, but it helps to strengthen the vessel, by holding the sides together. In ships of war, the number of decks varies with the rate or size. First and second rates have four whole decks, stretching throughout from stem to stern. Smaller ships have two whole and one half decks; while a still smaller class have only one of each.

Where there are several decks in a ship, they are distinguished by different names. Thus, the *upper* or *spar* D., open to the sky, stretches from stem to bow, and is conventionally divided into *quarter-deck*, *waist*, and *forecastle*. The *main* or *gun* D. is immediately below the upper deck. The *middle* D. is next under the main D., and is rather thicker and stronger. The *lower* D. is in the broadest part of the ship, and is made very strong, to receive the heaviest guns. The *orlop* D. is the lowest of all, and is often only temporary; it is chiefly occupied as store-rooms. Some of the above are wanting in all but the largest ships; and other names are occasionally substituted. A *flush* D. is a continued floor from stem to stern, upon one range, without any break.

DECKANEE' HEMP. See HIBISCUS.

DECK'ER, Sir MATTHEW, Bart., a political economist and free trader, was b. at Amsterdam, Holland, in 1679. He went to London in 1702, was naturalized as an English subject in the following year, and having embarked in commerce, attained the greatest success; received a baronetcy in 1716, and three years afterwards, took his seat in parliament as member for Bishop's Castle. He sat in the house, however, only for four years. His death took place Mar. 18, 1749; the baronetcy then became extinct, and his daughters succeeded to his estates.

D., in 1743, published a pamphlet, which in twelve years ran through seven editions, in which he proposed to raise all the public supplies from one single tax—namely, a tax upon houses. According to D.'s calculation, there were then in England, exclusive of Wales, 1,200,000 houses; of these he meant to tax only one half, counting off 500,000 as inhabited by the working-classes, and 100,000 as being uninhabited. By this means he proposed to raise an annual revenue of £6,000,000, which sum was £1,000,000 more than the expenses of the government of that day required. The surplus was to be applied as a sinking-fund for the purpose of discharging debt.

DECLAMA'TION (Lat. *declamare*, to speak loudly, hence to exercise one's self in rhetorical delivery), is the art of speaking according to rules, whereby the sense of the words, as well as the feeling and sentiment, is naturally and characteristically represented. Recitation, therefore, whether spoken or sung, is subject to the laws of D., from which it derives its value and significance. Perfect D. implies correctness of speech, distinctness and clearness of enunciation, and a well-toned voice. D. is therefore clearly of a musical nature. In music, however, D. is so far different from the D. of speaking, that the singer must adhere to what the composer has written, as it is the latter who fixes the whole of the intonation, modulation, and phrasing, and also the *tempi* and expression, and who not unfrequently sacrifices the correctness of the D. to the charm of some peculiar melodic phrase or pleasing rhythm, or a vocal musical embellishment. The truth and beauty of correct musical D. are always endangered by a translation of the original words into another language, a work which, with the greatest care and ability, it is in many cases almost impossible to accomplish word for word, or syllable for syllable, so as to fit accurately to the accent of the music. The master-works of many great composers suffer much in this respect, at which our musical public seem quite indifferent, while listening to translations of operas so carelessly executed as to destroy their greatest beauties, and frequently altogether to distort the sentiment. In earlier times, as well as now, considerable trouble has been taken to

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establish D. as a science. The ancients had a kind of note, or sign of intonation, which they placed over or under the words, possibly to decide whether the accent should be given by a high or by a low tone, and thus to regulate the modulation of the voice. That the theatrical D. of the ancients resembled the musical recitative of the present day, is generally admitted. In the German language, there are numerous works written on the art of declamation.

DECLARATION, in common law, was the pleading in which the plaintiff in an action at law sets forth his case against the defendant. The plaintiff might declare as soon as the defendant had made appearance in answer to the writ of summons (q.v.), or, where the summons was not specially indorsed (see INDORSEMENT), on failure of the defendant to make appearance. If the plaintiff failed to declare within a certain time, the defendant might obtain judgment of *Non Pros.;* and if the failure continued for a year after the writ of summons is returnable, the plaintiff was deemed out of court. On application to a judge, a plaintiff, if not prepared, might obtain time to declare; and a defective D. might be amended. Since the judicature act of 1875, the D. is no longer used in actions, and the *Statement of Claim* takes the place both of it and of the former BILL IN CHANCERY. By ord. xix. of the judicature act it is provided that, "unless the defendant in an action shall state that he does not require the delivery of a statement of complaint, the plaintiff shall, within such time and in such manner as hereinafter prescribed, deliver to the defendant after his appearance a statement of his complaint and of the relief or remedy to which he claims to be entitled;" and within eight days the defendant must give the plaintiff his defense or counter-claim. Such statements are to be as brief as the nature of the case admits.

In the U. S. the systems of civil procedure of the courts of the various states differ so materially, that it would be impossible to lay down any absolute rules as to the use of terminology and laws of pleading. Many states, however, have substituted a pleading called a complaint for the D. as formerly used in England. The state of N. Y. and many western states following its lead, have thus departed from the common law system, while in most of the older states and in the courts of the U. S. there is a closer adherence to the English methods.

DECLARATION, in lieu of an oath. Quakers, Moravians, and Separatists, who object to swear on religious grounds, have been permitted by several statutes to substitute a simple D., or *affirmation*, as it is called, for an oath. See AFFIRMATION. The members of all other Christian sects may still be compelled to swear, whatever be their scruples, in criminal cases. But as regards civil cases, it was enacted by the common-law procedure act of 1854 (17 and 18 Vict. c. 125, s. 20), that any person who should declare that the taking of an oath is, according to his religious belief, unlawful, should be entitled to substitute an affirmation, or D., and that persons making a false affirmation should be subject to the same punishment as for perjury. In the following year (1855), these provisions were extended to Scotland by 18 Vict. c. 25, s. 1; and by s. 2, the queen is empowered, by an order in council, to direct the provisions of the act to be applied to all courts in Scotland; by which would seem to be meant all courts other than the "courts of civil judicature" mentioned in the first section, i.e., to all criminal courts. See AFFIRMATION.

DECLARATION IN CRIMINAL PROCEEDINGS. In Scotland, the statement made by the prisoner before the examining magistrate is called his declaration. It is the duty of the magistrate to take this D. immediately on the prisoner being brought to him —that is to say, if he is in his sober senses. The magistrate must previously inform him that it is entirely at his own option to declare or not, but that if he chooses to declare, the D. may be used in evidence against him on his trial. In practice, the examination is generally conducted by the procurator-fiscal, who knows more of the facts of the case than the presiding magistrate. It is taken down by the clerk of court, the magistrate usually dictating to him the form of words which he conceives will most accurately convey the meaning of the prisoner, in case of his statement being of such a rambling description as to render the writing down of the very words impossible. The D. ought to contain the name, age, and designation of the prisoner, the parish and county in which the crime is said to have been committed, and all similar particulars. When completed, it must be read over to the prisoner, who, if he is able to write, signs every page of it along with the magistrate.

DECLARATION, DYING. The rule that secondary or hearsay evidence is inadmissible, suffers an exception, both in England and America, in the case of a declaration made by a person under the conviction of his impending death, and who does not survive the trial. Such declarations are of peculiar value for the ends of justice, where the party emitting them dies of injuries which are the subject of the prosecution. In cases of murder, the dying D. of the sufferer as to the circumstances of the crime is always admitted as evidence on the trial of the prisoner, provided that it was deliberately emitted while the deceased was in possession of his faculties, and that it is proved by credible witnesses. If it be possible, the dying D. should always be committed to writing, and tested in the most complete manner that is consistent with the circumstances in which it is emitted. In cases of necessity, however, it may be proved by

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parole evidence. As to the other cases in which secondary or hearsay evidence is admissible, see EVIDENCE.

DECLARATION OF INDEPENDENCE, AMERICAN, agreed upon July 4, 1776, by the thirteen American colonies then in revolt against England. Its history is brief but important. Early in 1776, the delegates in congress from Massachusetts were directed to vote for independence of England. Soon afterwards several other colonies sent similar instructions. Washington wrote: "A reconciliation with Great Britain is impossible. When I took command of the army I abhorred the idea of independence; but I am now fully satisfied that nothing else will save us." Pennsylvania and New York were the last to acquiesce in the demand for a declaration. The tenor of these instructions to the delegates from their constituents was in favor of cutting loose from Great Britain entirely and forming an independent government. June 7, 1776, Richard Henry Lee moved in congress that "these united colonies are and of right ought to be free and independent states." Four days later the motion was adopted, and two committees were raised to present a declaration and the plan of a confederation. On the declaration committee were Jefferson, Franklin, John Adams, and Roger Sherman. They reported June 28, but action was delayed, as the New York and Pennsylvania congressmen having received no special instruction, thought they had no authority to vote for the declaration. The Declaration of Independence was drafted by Thomas Jefferson, and but very slightly changed from his copy. When it came up for final action it received the vote of every delegate. The vote was taken by colonies, and every colony gave unanimous approval. It was immediately signed by the names of 56 members present, and as soon as the slow means of printing and circulating in those days could spread it, it went forth not only as the defiant answer of the colonies to the demands of the mother country, but as a claim for the political emancipation of mankind. It ought to be known by heart by every boy and girl in America. Not many years ago the reading in full of the Declaration of Independence was considered as necessary in any social celebration of the 4th of July as a prayer in religious services; but in these days, partly from carelessness, but more from the large infusion of foreigners whose habits and ideas have greatly modified the primitive notions of our own people, the custom has fallen into disuse. See INDEPENDENCE, DECLARATION OF.

DECLARATION OF INDEPENDENCE, MECKLENBURG. See MECKLENBURG, DECLARATION OF INDEPENDENCE.

DECLARATION OF PARIS, a protocol signed by the representatives of all the powers present at the congress of Paris in 1856, and subsequently accepted as a binding engagement of public law by all the other powers (except the United States, Spain, and Mexico) for the purpose of settling and defining certain rules of maritime law, in time of war, on points of great moment to belligerent and neutral states. The four propositions agreed to were: 1. Privateering is and remains abolished. 2. The neutral flag covers enemies' good, with the exception of contraband of war. 3. Neutral goods, with the exception of contraband of war, are not liable to capture under an enemy's flag. 4. Blockades, in order to be binding, must be effective—that is to say, maintained by a force sufficient readily to prevent access to the coast of the enemy.

DECLARATION OF RIGHTS. See RIGHTS.

DECLARATOR, a form of action in the court of session in Scotland, the object of which is judicially to ascertain a fact, leaving its legal consequences to follow as a matter of course. Such are declarators of property, of contravention under an irritancy in an entail (q.v.), of non-entry, of marriage, of bastardy, and many others. The declaratory conclusions of such actions are generally followed by petitory or possessory ones, for the purpose of giving effect to the right declared; but this is by no means necessarily so. A substantial interest on the part of the pursuer must, however, in all cases be shown, as it is not competent to ask the court to declare a mere abstract fact or right. The existence of this special form of action has contributed to diffuse in Scotland a false view as to the nature of actions and judicial proceedings generally from which many even eminent lawyers have not been free. It is said that decrees upon actions properly declaratory "confer no new right, but only declare that a right exists in the pursuer," as if in this case they were an exception to decrees in general, whereas it is obvious that no decree can confer a new right on the pursuer, otherwise than by committing an act of injustice against the defender. In England, there are no actions of D., an arrangement often wondered at in Scotland, but in which the English seems to be more logical than the Scotch law, inasmuch as all actions are actions of declarator.

DECLENSION, a grammatical term applied to the system of modifications called *cases*, which nouns, pronouns, and adjectives undergo in many languages. How the words declension (Lat. *declinatio*, a declining, or leaning away) and case (Lat. *casus*, a fall) came to be applied to this species of inflection, has never been made altogether clear. The relations in which one thing stands to other things may be expressed in either of two ways. Some languages make use of separate words, called prepositions; in others, the relations are expressed by changes in the termination of the name of the thing. Thus, in Latin, *rex* being the root or crude form of the word for "king," *regis*,

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or *rex*, is the word in the nominative case, signifying "a king" as subject or agent; *regis*, in the genitive case, "of a king;" *regi*, in the dative, "to a king," etc. An adjective joined to a noun usually takes a corresponding change. The number of cases is very different in different languages. The further we go back in the history of the Indo-European languages, the richer do we find them in these modifications. Sanscrit had eight cases, Latin six, and Greek five. The names of the Latin cases, which are often used also in regard to the English language, are the nominative, which names the subject or actor; the genitive, expressing the source whence something proceeds, or to which it belongs; the dative, that to which something is given, or for which it is done; the accusative, the object towards which an action is directed; the vocative, the person addressed or called; and the ablative, that from which something is taken. The Greek has no ablative case. The Sanscrit, in addition to the Latin cases, has an instrumental case and a locative case. The grammar of the inflecting languages is complicated by the circumstance that all nouns do not form their cases in the same way. This makes it necessary to distribute nouns into various classes, called "declensions." In Latin, as many as five declensions are usually given. See INFLECTION. As we descend the stream of time, the case-endings become rubbed off, as it were, and prepositions are used in their stead The languages descended from the Latin (French, Italian, etc.) have lost all the cases of nouns and adjectives. The Gothic languages, of which Anglo-Saxon is one, had cases almost as numerous and perplexing as those of the Latin. German is still to a great extent encumbered with them. English has only one case in nouns different from the nominative—namely, the genitive, or possessive. See NOUN. The declension of pronouns (q.v.) has been more persistent than that of nouns and adjectives. Languages of the agglutining order have, in general, a great abundance of cases. In Finnish, nouns have fifteen cases. Thus, *karhu*, a bear; *karhun*, of a bear; *karhuna*, as a bear; *karhutta*, without bear; *karhussa*, in the bear; *karhusta*, out of the bear, etc. In the Magyar, twenty cases may be reckoned; and the languages of the North American Indians are richer still—perhaps we should say more embarrassed. What case endings and other inflectional terminations were in their origin, as well as the comparative merits of the highly inflected and the analytic languages, will be considered under INFLECTION.

DECLINA'TION. If a great circle be drawn through the pole of the heavens and any star, the D. of the star is the portion of the circle intercepted between the star and the equator. The place of a point in the heavens is determined by its right ascension and D. just as a point in the earth's surface is determined by its latitude and longitude. See ARMILLARY SPHERE.

DECLINATION NEEDLE. When a magnetic needle is suspended or made to rest on a point so as to be free to move in a horizontal plane, it finds its position of rest in a line joining two fixed points on the horizon; and when made to leave that position, after several oscillations, it returns to it again. At certain places on the earth's surface, these two points are the n. and s. points of the horizon; but generally, though near, they do not coincide with these. A vertical plane passing through the points on the horizon indicated by the needle, is called the magnetic meridian, in the same way that a similar plane, passing through the n. and s. points, is known as the astronomical meridian of the place. The angle between the magnetic and astronomical meridian is termed the declination or variation of the needle. The declination is e. or w., according as the magnetic n. lies e. or w. of the true north. Instruments for determining magnetic declination are called declination needles, or declinometers. In this instrument there are two things essential—the means of ascertaining the astronomical meridian, and a needle for showing the magnetic meridian. The common form of declinometer consists of a tripod provided with leveling screws, and supporting a pillar, to which is fixed a graduated azimuthal circle. A compass-box, with vernier attached, moves on the azimuthal circle by means of a pivot at the top of the pillar. Two uprights are fixed to the side of the compass-box, on which rests the axis of a telescope. A graduated arc is fixed to the bot om of one of the uprights, and the angle of elevation of the telescope is marked by a vernier on the arm attached to the axis of the telescope. A level is also hung on the axis of the telescope, for adjusting the instrument. Inside the compass-box is another graduated circle, the line joining the zero-points of which is parallel to the axis of the telescope. All the fittings are in brass or copper, iron, of course, being unsuitable. The compass-box and telescope move round as one piece on an axis passing through the center of the azimuthal circle. When an observation is made, the telescope is pointed to a star whose position with regard to the astronomical meridian is known at the time of observation. The telescope with the compass-box is then brought the proper number of degrees on the azimuthal circle, until its axis is in the meridian of the place If, when the telescope is in this position, the n. end of the needle stand at the zero-point of the inner circle, the declination would be 0°; but if it lie e. or w. of this point, the declination is shown by the degree at which the needle stands. It is difficult to construct a needle so that the line joining its poles exactly coincides with the line joining its visible extremities. If this coincidence be not perfect, the geometrical axis of the needle according to which the reading is made lies to the right or left of the magnetic axis, and consequently of the true reading. To remedy this, the needle is so made that it can rest either on its lower or upper surface. In

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finding the true reading, the position of the needle is marked, and then it is turned upside down, and again marked, the mean of the two readings giving the true one. The declination of the needle may be also ascertained by the "dipping needle "(q.v.). The ordinary compass which must be used by making allowance for declination, is a declination compass. See MAGNETISM. See illus., COMPASS, ETC.

DECLINOM'ETER. See DECLINATION NEEDLE.

DECOCTION is the term applied in pharmacy to the solution procured by boiling an organic substance with water.

DECOLORIM'ETER is an instrument for determining the power of portions of bone-black, or animal charcoal, to abstract coloring matter. See BONE-BLACK.

DECOMPOSITION is a term employed in chemistry to signify the breaking of a compound substance into substances of simple composition. It is the opposite of *combination*. Decompositions are effected by various modes of energy which increase internal motion and thus remove atoms from the attractions by which they were held together; or elemental substances, or compounds stable under the conditions of the experiment, from the original substance. Conditions which favor decomposition are often applied to bring about new combinations because atoms when released from one set of attractions respond to other, but only slightly stronger, attractions as they could not have done before the old bonds were loosed.

Heat is one of the most common of decomposing agents; mercuric oxide (HgO) when heated breaks into the invisible gas oxygen (O) and the liquid metal mercury (Hg); limestone ($CaCO_3$) separates into quicklime (oxide of lime, CaO) and carbon dioxide (CO_2); sugar ($C_{12}H_{22}O_{11}$) gives off water (H_2O) and leaves charcoal (C) behind; coal and wood decomposed into a great variety of useful substances. The more complex an organic compound is the more easily it is decomposed by heat, speaking generally, and such decompositions are beyond any possibility of recombination; less complex substances may sometimes recombine when the heat is removed.

Electricity is a potent decomposing agent; under its influence water (H_2O) is separated into oxygen (O) and hydrogen (H) and metallic salts are broken apart; this has been applied in analytical processes and in the separation of metals from their ores. *Light* effects many decompositions, as of the silver salts used in photography, nitric acid, and hydrogen peroxide. *Percussion* explodes nitro-glycerine, and even a touch causes iodide of nitrogen to decompose violently. (*Note.—Zymosis* and *Hydrolysis* are terms recently proposed to distinguish between the decompositions caused by true ferments like yeast and those by unorganized bodies like ptyalm. The terms are similar to *Electrolysis*—decomposition by electric current). *Ferments* (minute vegetable and animal organisms) cause many decompositions, such as the breaking of dextrose ($C_6H_{12}O_6$), in the presence of yeast, into alcohol (C_2H_5OH) and carbon dioxide (CO_2), and the common decompositions known as putrefaction and decay. *Chemical Attraction* is a very frequent cause of changes which may be considered decompositions. A portion of compound is withdrawn from it by the presentation of an attraction sufficiently great, and the residue either forms one substance or rearranges itself into several. Thus sodium is said to decompose water because its attraction for oxygen removes it from the water and hydrogen is set free. The attraction of hydrogen for oxygen is the cause of many decompositions, e.g., nitric acid and hydrogen under certain conditions give nitric oxide and water ($HNO_3+3H=NO+2H_2O$).

Certain imperfectly understood classes of decomposition must be mentioned by illustration. Starch ($[C_6H_{10}O_5]n$) under the influence of various substances—dilute sulphuric acid, ptyalm of the saliva and others—takes water and splits into a sugar: hydrogen peroxide (H_2O_2) by mere contact with platinum decomposes rapidly into water and oxygen without any apparent change in the platinum; complex albuminous substances in the animal body break down into much simpler compounds during the processes of tissue change. In general the quantity of heat or energy required for the decomposition of a compound is equal to that which was produced in the formation of the compound. The decompositions of a substance play an important part in the arguments for its structure, or the manner in which its elements are joined together; thus the ready separation of OH from methyl alcohol (CH_4O), and also the removal of ¼ (and no more) of its hydrogen by means of sodium are used as indications that this and other alcohols are like Metallic hydroxides (NaOH, etc.) in their structure, and may be written CH_3OH, etc. In double decompositions two compounds react upon one another to bring about a separation and rearrangement. The corresponding parts change places—AB and CD become AD and CB. Thus sodic chloride (salt) and silver nitrate become sodic nitrate and silver chloride ($NaCl+AgNO_3=Nano_3+AgCl$). Double decompositions have important application in the preparation of many chemicals used in the arts; for instance, by the double decomposition of sodium nitrate and sulphuric acid sodium acid sulphate and nitric acid are made ($NaNO_3+H_2SO_4=NaHSO_4+HNO_3$) and the nitric acid, a liquid of low boiling point, is distilled away from the other compounds and collected; in what is known as the "ammonia-soda" process for making bi-carbonate of soda, carbon dioxide (CO_2) and ammonia (NH_3) are conducted into a strong solution of salt (NaCl) and the bi-carbonate of soda ($HNaCO_3$), the least soluble of the substances present, falls as a precipitate and ammonium chloride (NH_4Cl) is left in solution. ($CO_2+NH_3+H_2O=$

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HNH_4CO_3. $HNH_4CO_3 + NaCl = HNaCO_3 + NH_4Cl$). Double decompositions are very useful in the systematic course of detection of chemical substance (qualitative analysis) and in the conversion of substances into compounds which may be conveniently weighed. (GRAVIMETRIC METHODS OF QUANTITATIVE ANALYSIS).

DECOMPOSITION OF FORCES. See COMPOSITION.

DECORAH, a city and co. seat of Winneshiek co., Iowa, on the Chicago, Milwaukee, and St. Paul railroad; and on the upper Iowa river; pop. '90, 2,801. It is the seat of the Norwegian Lutheran college, and has many important manufactures.

DECORATED STYLE of Gothic architecture. During the reigns of the first three Edwards, from the latter part of the 13th till nearly the end of the 14th c., Gothic architecture may be said to have been in full bloom in England. It attained perfection somewhat earlier in France and Germany, and somewhat later in Scotland, and consequently the buildings on the continent which correspond to what is called the D. S. in England, belong, for the most part, to the beginning, and those in Scotland, for the most part, to the end of the 14th century. The D. S. arose so gradually out of the style which preceded it, and merged so gradually into that which followed it, that it is not wonderful that different periods of duration should be assigned to it by different writers The longest, probably, is that mentioned by Britton, from 1272 to 1461; and the shortest by Rickman, from 1307 to 1392. In fixing on the middle of the 14th c. as its highest point, however, they are all pretty much agreed, and the same agreement is exhibited in recognizing it as the most perfect of the Gothic styles. The decorated was a higher development of the early English style, all the peculiarities of which, both in its forms and in its adornments, it exhibited in greater perfection and richness; and it is remarkable that when we pass from it to the more elaborately florid style which succeeded it, the degeneracy in sculpture is as perceptible as in architecture. It seems, indeed, as if the school of art which we regard as the peculiar production of the middle age, then attained, in all its branches, to a point which admitted of no further progress in that direction Nor is this remark confined to art, as addressed to the eye, for that it applies equally to poetry will be at once admitted, when it is remembered that the era which we have assigned to the D S. throws it almost entirely within the period which is covered by the long life of Chaucer. It is a striking instance, moreover, of the intimate relation which subsists between the æsthetic and the general life of a nation, that it was at this very same period that the social, political, and religious institutions of mediæval life culminated. Chivalry and feudality were in the fullness of their vigor, and the church had only just begun to give employment to the innovating minds of the first reformers. Of all the epithets which have been employed to characterize this style—absolute Gothic, pure Gothic, complete Gothic, and the like—that of the "middle pointed" is, perhaps, the most descriptive; the simple pointed arch, described from an equilateral or obtuse-angled triangle, being retained, but the window being enlarged, divided by mullions into several lights, and the heads filled with tracery. Of this, as of all the other styles of architecture, the most characteristic feature of all is unquestionably the capitals of the pillars. Of the foliage which is employed in the decorated capital, Mr. Bloxam remarks, that it "may generally be distinguished from that of the early English by its not rising from the neck molding with stiff stems, but being carried round the bell in something of a wreath-like form. . . . It often exhibits much of natural freedom; and we frequently find the oak, the ivy, the fern, etc., beautifully copied from natural leaves.

DECORATION DAY. See DAY OR DAYS.

DECORATIVE ART. Man instinctively takes an interest in Nature and tries to express his pleasure in her works by imitating them: this is Art. When he further takes an interest in his own work and tries to express his pleasure in it by treating it as Nature treats her work, by improving it, by lingering over its necessary form and color, and heightening their effect of strength or tenderness, it becomes Decorative Art Ornamentation must help not hinder the usefulness of the thing decorated, must not conceal, but rather express its construction, hence the first necessity of this kind of Art is *Adaptation*. Ornamentation must also have a *Signification*: it must mean something; nonsensical ornamentation expressing no interest is prohibited, and it must also have a natural beauty to make it harmonious with the intention of Art. A third qualification is *Abstraction*, or simplification of natural beauty to suit it to the purposes of Art. This is often called Conventionalism, a word to which is sometimes attached a double meaning. Beauty should be adapted to use not use to beauty. Right conventionalism first suits the imagination; the pictures or articles must not deceive; they must remind. In the second place, it must suit the material and imitate only those points in Nature which can be imitated successfully under the circumstances. Lastly, it must suit the use. False Conventionalism contradicts the significance of Art: it teaches one to adapt natural to ideal or academical notions of beauty, contrary to Nature. Thus there is a right and wrong in Decorative Art, but it does not depend upon anybody's dogmatization We can judge of a style of Art only when we understand the circumstances under which it was created. Ruskin says: "The Art or general productive and formative energy of any country is an exact exponent of its ethical life." Each nation has had its period of Decorative Art. Egypt, Assyria, Persia, Japan, Rome—each has impressed its peculiarities upon the relics left for our examination. The Greeks were not great decorators, but they were great artists, and when they turned their attention to ornamentation they

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sealed everything with the distinguishing mark of their character, which was harmony —harmony of body, of mind, of moral life. The Gothic and Renaissance artists based their ornamentation upon special motives, the original meaning of which they kept always in sight; so the Tudor rose, the French lily, the "totems" of the noble families, in their decorations had an interest, unfelt in our wall papers and carpets, and a fitness and propriety which we can hardly realize, overwhelmed as we are with machine-made goods, commonplace and indefinitely reproduced, adapted to everybody and everything, but to nobody and nothing in particular. Thus it is seen how universal is Art, how impossible to remove, to ignore; it is everywhere around us like the air we breathe. Some art we are bound to have, therefore it should be cultivated, and the universal civilizing interest, recently revived in the cultivation of domestic Arts should not be allowed to die out; and arts long since lost may once more be brought into vogue, not only among the rich, but they may carry joy and refinement into the homes of the poor. There is much to be said upon the subject of Machine-Made Art so-called; there certainly is no pleasure in gazing continually at the same pattern spread over our walls, and in finding it continually repeated elsewhere, and yet the human appetite is always quite keen enough for ornament of every kind. The need is for less ornament rather than more, but for greater discrimination in its use. What, then, is the new thing most needful in the public attitude towards Decorative Art? To study Nature, and, after training the hand to perfect draftsmanship, as did the Greeks, represent her as she is seen, always harmonious and delightful. The revival of Decorative Embroidery (q.v.) has not been overlooked in the general awakening consequent upon the exhibitions and efforts put forth to improve the Art of Decoration in general. Its beginnings were prehistoric. In the prime of Greek Art it was an important element, and although it has died many deaths, it has always sprung, phœnix-like, from the fire again. The best artists of all times have lent their aid to furnish designs for embroidery, and in ecclesiastical decoration nothing can exceed the beauty of some well-known specimens of needlework. The same may be said of Tapestry Painting, recently introduced by some French artists, which produces a good imitation of the Gobelin. *The Society of Decorative Art*, located at 28 East 21st St., N. Y. City, was established Feb. 24, 1877, by five persons, who had foreseen the necessity for some depot where indigent gentlewomen or any self-supporting ladies could exhibit their work, with a view to disposing of it; for the diffusion of a knowledge of decorative Art among women, and to train them in artistic industries. To effect its object the Society applied itself vigorously in several different ways. Its first effort was to induce Art-workers to master thoroughly the details of whatever branch they undertook in order to make for themselves a reputation of value. It also acted as a guide to those who had worked unsuccessfully, by directing them into another channel where they might meet with more success. It established classes for Decorative Art work and loaned books all over the country, thus assisting those at a distance from Art centres, and acted as a medium for receiving orders not only from private individuals, but from dealers in pottery, china, titles, etc. The art of needlework has received special attention with regard to adapting it to household necessities. How well the Society has accomplished its aim is shown by the latest report, which gives the number of contributors as 4885; the amount of money handled nearly $40,000. The Society is governed by a Board of Managers, from whom the officers are chosen, with an Art Council, composed of some of the leading Artists of the city. From this parent Society have sprung many others, working in unison with it, all over the country. Similar ones have been started in New York City under the names of the "New York Exchange for Woman's Work," and the "Madison Avenue Depository and Exchange for Woman's work." These have proved very successful.

DECORATIVE NEEDLEWORK, REVIVAL OF. With the revival of decorative art in general, which has swept like a vast wave over England, as well as the United States, during the last twenty or thirty years, not any branch has shown more life than that of needlework. No art has a nobler history or finer ancestry. Its beginnings were prehistoric. In the prime of Greek and Byzantine art, it was an important element and English women in the thirteenth and fourteenth centuries were the queens of it. Under the reign of the Stuarts it began to decline, and in Queen Anne's (q.v.) time it took to French models, until finally it resigned all pretension to art in England. Italy has always held a higher place in this art than any other European country. In France in the seventeenth and eighteenth centuries the embroideries were gorgeous in the extreme. The Spaniards have always been splendid in their tastes. Their old work gleamed with the coloring of burnished metals, but they were beautifully harmonious. In ancient times the first artists gave designs for embroidery. Vasari tells us that the well-known specimens of needlework still to be seen in the Baptistery in Florence were designed by Antonio Pollaniolo and were embroidered by Paolo de Verona, "a man most eminent in his calling and of incomparable ingenuity." In olden times men seem to have been the embroiderers, as they now are in Japan, yet women have always been adepts in it. At the commencement of the revival little more was done than to copy the ancient embroideries, of which great numbers are to be found. And so entirely was the art lost that the various stitches, on the use of which so much of its beauty depended, had to be learned again by close inspection and sometimes by

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picking out carefully old pieces of work. To be truly artistic the design should be original and adapted to the use for which the piece is designed. To further this laudable desire, artists no less famous than Burne-Jones, Selwyn Image, and Walter Crane have consented to furnish designs. Thus a style completely different from that of any previous age may fairly be said to have sprung up in the present revival of embroidery as an important decorative art. Mr. Crane has gone chiefly to the ever-pleasing Greek traditions for his inspirations; and some designers have for the most part drawn their ideas from Italian needlework art; but others have a distinctive character of their own, which cannot be referred to any one type. Mr. Image's designs have a character wholly original, and great freedom from mannerism prevails in the designs of Mr. Aitchison and some others, chiefly architects, who certainly are the most successful in producing designs capable of effective treatment with the needle. Designers for needlework have much to learn, in order to produce something capable of being worked so as to be beautiful in itself without costing an enormous amount of labor, and, therefore, of money. In New York City, the Associated Artists and Decorative Art Society have taken the lead in producing the most artistic designs, the finest work, and on the greatest variety of materials. Textures of silk and silk and wool, woven with peculiar effect, and made specially to order, enhanced the beauty of their work, and its fame has spread until houses and churches have been decorated to order by these societies.

DE COSTA, Benjamin Franklin, D.D.: b. Charlestown, Mass., 1831: graduated at Biblical institute, Concord, N. H., 1857; a clergyman of the Episcopal church; was a chaplain in the army during the civil war. He has published many valuable contributions to early American history, and monographs on local history, the most important being: *The Pre-Columbian Discovery of America by the Northmen*, 1868; *The Northmen in Maine*, 1870; *Columbus and the Geographers of the North*, 1872; *Lake George: its Scenes and Characteristics*, 1869; *Narrative of Events at Lake George*, etc., 1868; *Notes on the History of Fort George during the Colonial and Revolutionary Periods*, 1871; *Sketches of the Coast of Maine and Isle of Shoals*, 1869; *The Fight at Diamond Island*, 1872; *Hiawatha: the Story of the Iroquois Sage in Prose and Verse*, 1873; *The Lost City of New England*, 1877; *The Moabite Stone*, 1871; *Verrazzano the Explorer*, 1880; *Cabo de Baxos, or the Place of Cape Cod in the Old Cartology*, 1881; *Cabo de Arenas, or the Place of Sandy Hook in the Old Cartology*, 1885.

DECOY DUCK, the effigy of a duck or a tame duck employed to draw others into a net or into a place where they may be taken.

DECREE NISI, sometimes called *rule nisi*, under the common law practice and the practice of most States, a decree of a court which may take effect only on the happening of some future event. This is almost always a default of the opposed part to show cause why the decree should not take effect. A decree nisi may therefore be defined as a conditioned decree. Under most codes and practice acts this form of decree is called an order to show cause.

DECREE', in theology. See Predestination.

DECREPITATION is the term applied to the crackling sound heard when a substance like common salt is thrown upon a fire. A series of minute explosions occur, owing to the water between the plates of the crystalline particles becoming expanded by the heat, and ultimately bursting them.

DECRESCEN'DO, in music, is the reverse of crescendo—viz., a gradual diminishing of the sound. The executing of the D. is very difficult, whether on one or more notes. Like the crescendo, it is also frequently combined with a slight ritardando, especially in descending passages. It is frequently marked thus 

DECRE'TALS are the answers sent by the pope to all applications made to him as the head of the church, chiefly by bishops, but also by synods, and even by private individuals, for guidance in cases involving points of doctrine or discipline. In the early days of the church these replies, as circulated through the various dioceses, furnished precedents to be observed in analogous circumstances. From the 4th c. onward they formed the most prolific source of canon law. False Decretals is the term applied to what are supposed to be some of the most famous of literary forgeries, including a collection of papal letters, canons, etc., of which some are probably genuine, but the greater part spurious. The first edition appeared about the middle of the 9th c., and from the preface is supposed to be the work of Isidorus Mercator, a fictitious name thought by some to indicate bishop Isidore, of Seville. After the preface and some minor apocryphal documents, the first part contains 50 of the apostolic canons, and 60 spurious decretals from Clement (101 A.D.) to Melchiades (314), chronologically arranged. The second part consists chiefly of canons taken from the *Hispania*, a collection made towards the close of the 7th century. The third part contains 35 fictitious decretals. These false decretals were received everywhere as true, until cardinal Nicolas de Cusa, in the 15th c., first expressed doubts of their genuineness. They were fiercely attacked by the reformers, and not long afterwards the stigma of "false" was fairly fixed upon them.

DECU'RIO, a Roman cavalry officer, commanding 10 men.

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DECUSSA'TION, in anatomy, the crossing of nervous filaments. Certain fibres of the anterior pyramids and lateral columns of the medulla oblongata are so crossed freely from side to side; so that disease on one side of the brain often leads to paralysis on the other side of the body.

DEDHAM, town and co. seat of Norfolk co., Mass., on Charles river, 11 m. s.w. of Boston. It was incorporated in 1636; contains over 20 villages; and is principally engaged in the manufacture of woolen goods, hosiery, absorbent cotton, cocoa, and pottery. There are a high school, public library, national and savings banks, and several charitable institutions. The court house is a handsome granite building. Pop. '90, 7123.

DEDICATION, in literature, the address of a book, or any literary work, to a person or party; *vide* Shakespeare's note to the right honorable Henry Wriothesly prefaced to *Venus and Adonis*. The custom is as old as literature, and doubtless originated in a desire to win the favor of some powerful patron. Occasionally may be found such a dedication as "To My Mother," or "To My Wife," but usually they are to public persons. Of late years the custom has to a great extent fallen into disuse, as not accordant with the independent spirit of our times.

DEDUCTION is a particular kind of reasoning or inference. In ordinary language, to deduce means to trace one thing to another as its cause, to show that one proposition follows from some other proposition or propositions. In logic, its signification is more definite. It is usual to oppose deduction to induction (q.v.), and to say that the latter consists in reasoning from particulars to generals, the former in reasoning from generals to particulars. In fact, however, every step in a deduction is also an induction. The several steps of a train of deductive reasoning consist of syllogisms (q.v.), and the major proposition of a syllogism is an induction, or a general proposition expressing the result of a previous induction. The whole object of this kind of reasoning is to show that some particular case or phenomenon really has the marks which bring it under the class to which the general proposition was meant to apply. Thus, the equality of the angles at the base of an isosceles triangle is deduced from the general proposition, "That magnitudes which can be applied to one another so as to coincide are equal," by showing that the angles in question can be so applied.

Deduction is more properly opposed to experiment. Suppose the question to be as to the relation between the spaces and times in falling bodies, the point may be determined in two ways. We may institute experiments, and observe how far bodies *do* fall in different times, and conclude a general proposition from the particular instances we observed; or we may bring the case under two general principles already established, those, namely, expressed in the first law of motion, and in the nature of gravity as a moving force, and calculate from these how far bodies *will* or *must* fall in given times. The conclusion or law arrived at in both cases is the same; but in the one case it is experimental, in the other deductive. It is the tendency of all sciences to become more and more deductive. Knowledge put on a deductive basis is sometimes spoken of as science, *par excellence*, and the immediate results of observation as empiricism. Mathematics is essentially a deductive science, and most of the truths in natural philosophy have been gradually put on similar grounds. Chemistry remains almost wholly experimental; it can predict or deduce little or nothing regarding an untried case, except, perhaps, the proportion in which two bodies will combine. See REASONING.

DEE, the name of two rivers in Scotland. The larger and more important rises in five wells 4,000 ft. above the sea, near the top of Braeriach mountain, in the neighborhood of Cairntoul and Ben Macdhui, 25 m. n.w. of Castleton of Braemar. After flowing 12 m. s.s.e., it joins the Geauley, at the height of 1294 ft. above the sea. It then tumbles through a narrow chasm in the gneiss rock, called the Linn of Dee, across which a person can leap. After this it runs e.n.e. through Aberdeenshire and a small part of Kincardineshire, and ends in the German ocean at the harbor of Aberdeen. In this course, 96 m. in all, it receives a number of tributaries—the Lui, Muic, Feugh, etc. The basin of the Dee, which is about 1000 sq.m. in area, consists of granite and gneiss in nearly equal areas. In the gneiss occur many beds of primitive limestone, and some masses of trap-rock and serpentine. On the Dee are Balmoral castle and several villages much resorted to in summer—Castleton of Braemar, Ballater, Aboyne, Kincardine O'Neil, Banchory-Ternan, and Cults. The soil on the Dee is light and sandy and requires much rain. A railway extends up Deeside for 43 m., from Aberdeen to Ballater. See BALMORAL and BRAEMAR.—The smaller Dee rises in Kirkcudbrightshire, near the northern boundary of that county. Its general direction for the first 40 m. is southeasterly, after which it flows w. to the Solway Firth, into which it falls at Kirkcudbright bay. The D. divides Kirkcudbright into two nearly equal portions, and near the center of the county it expands to about the average breadth of a quarter of a mile, preserving this appearance for about 10 m. of its course, and forming successively Loch Ken, Loch Dee, and Long Loch. It is about 50 m. in length, and is navigable for the last 7 miles. The waters of the D. are noted for their salmon, which are of a darker hue, and are fatter than those of most rivers in the s. of Scotland.

DEE, a river in England, draining parts of the shires of Merioneth, Denbigh, Flint, and Salop, in Wales, and the w. of Cheshire. Near Trevor, it is crossed by the Elles

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mere canal, on an aqueduct 1007 ft. long and 120 high; and also by the stone viaduct of the Chester and Shrewsbury railway, of 19 arches, each 90 ft. span, and 150 ft. high. Below Trevor, the D. winds first s.e., and then n. e., and n. to Chester, which city it nearly encircles. It ends in the Irish sea, in a tidal estuary 14 m. long and 2 to 6 m. broad, and forming at high-water a noble arm of the sea; but at low-water a dreary waste of sand and ooze, with the river flowing through it in a narrow stream. Its whole course is 80 m. long, and its chief tributaries are the Treveryn, Alwen, Ceiriog, Clyweddog, and Alyn. Its upper basin chiefly consists of Silurian strata, and its lower of new red sandstone. Canals connect the D. with the rivers of central England. The ancient Britons held its waters sacred.

DEE, JOHN, a celebrated astrologer and mathematician, was the son of Rowland Dee, "gentleman-sewer" to Henry VIII., b. in London, 13th July, 1527, and educated at St. John's College, Cambridge. After residing for some time at the university of Louvain, he went in 1550 to Paris, where, at the college of Rheims, he read lectures on the *Elements* of Euclid with very great success. In 1551, he returned to England, was presented by Cecil to Edward VI., and pensioned; but during the reign of the "Bloody Mary" he nearly lost his life. He again set out for the continent in 1564, ostensibly for the purpose of presenting to the emperor Maximilian a book which he had previously dedicated to him. Lilly, however, in his *Memoirs* (p. 224), affirms that he acted as queen Elizabeth's "intelligencer" or spy, and this theory is probably the true one. Lilly says that he was "a ready-witted man, quick of apprehension . . . . and excellent in all kinds of learning;" while the professional mask which he wore, the pretensions he made of being able to raise and converse with spirits, served to prevent all suspicion.

The impression that Dee had dealings with the devil, seems to have become more prevalent the longer he lived. In 1576, a mob assembled around Mortlake, his country residence, and, attacking the house, broke his instruments, and destroyed his library, which was large and costly, Dee and his family escaping with difficulty.

In the year 1581, having taken into his service an apothecary of the name of Kelly as assistant, Dee visited various continental courts, pretending to be able to raise spirits. Whether he took to this strange profession through a sincere belief in what he professed, or adopted it merely as a blind, a pretext for visiting foreign courts at which he had more serious business to transact, it is impossible to say. In 1595, he was appointed warden of Manchester college, where he resided nine years, and whence he returned to Mortlake. His death took place in 1608, in the 81st year of his age. He died very poor. Dee's writings are very numerous; they are chiefly scientific treatises, and many of them are still in manuscript in the Cottonian and other collections. In 1842, the Cambridge society published the Private Diary of Dr. John Dee, with a catalogue of his library of scientific MSS. made by himself.

DEED, in law, is a formal written expression of something done by the party or parties from whom it proceeds. The term is applied to almost every form of legal writing, and will consequently be treated under various heads. For various kinds of deeds, their provisions, manner of execution, etc., see ATTESTATION; BARGAIN AND SALE; CHARTER; CONVEYANCING; COVENANT; GRANT; HABENDUM; HOLOGRAPH; INDENTURE; LEASE; QUITCLAIM; SEAL; SIGNING, SEALING, AND DELIVERY; TITLE, REGISTRATION OF; TITLE-DEEDS; WILL.

DEEMS, CHARLES FORCE, D. D., b. Baltimore, 1820; a graduate of Dickinson college 1839, and not long afterwards agent in North Carolina for the American Bible society. In 1840 he accepted the professorship of logic and rhetoric in the university of that state. In 1846 he was a Methodist preacher at New Berne, and delegate to the general conference. He was for five years principal of the Gainsboro college for women; he was presiding elder of the Wilmington and New Berne districts 1858 to 1865. In 1865, he went to New York, where he took great interest in the founding of the "Church of the Strangers" (undenominational), of which he became pastor. In 1881 he founded the American Institute of Christian Philosophy. Dr. Deems published *Annals of Southern Methodism; Life of Jesus; The Home Altar;* etc. He d. Nov. 18, 1893. See his *Autobiography* (1897).

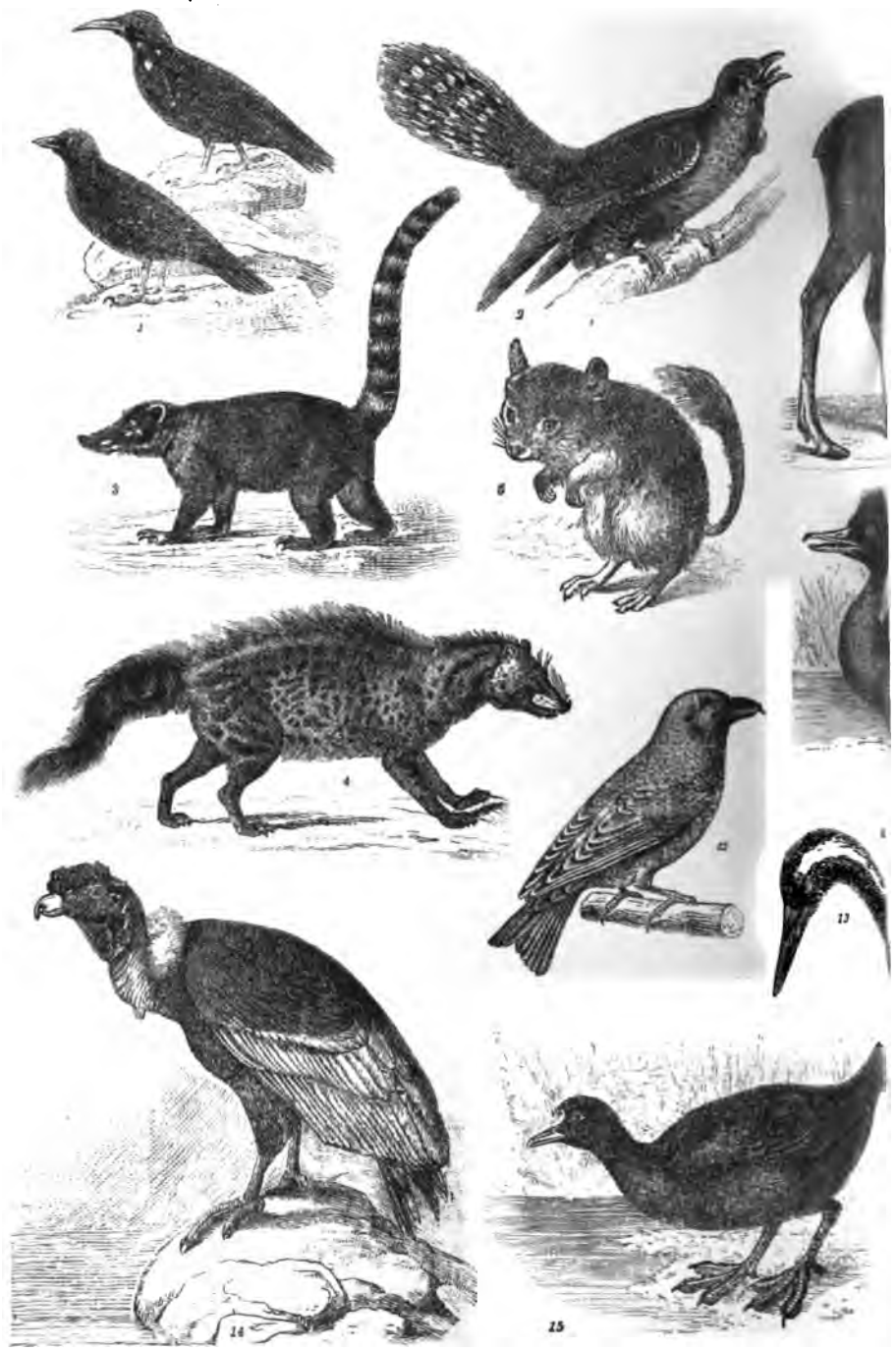
DEEMSTER, DEMPSTER, or DOOMSTER, the name of an officer formerly attached to the high court of justiciary in Scotland, who pronounced the doom or sentence of condemned persons. The office was held along with that of executioner. At the conclusion of a trial, this dread official was produced in open court, in presence of the wretched criminal, as is graphically described by Scott in his tale of *Old Mortality*. See notes to that work, and also notes to *Heart of Mid-Lothian*. The office of deemster has been long abolished. In the Isle of Man (q.v.) and Jersey (q.v.), deemsters are a kind of judges.

DEEP BOTTOM, on the n. side of James river, 12 m. by land and 20 by water below Richmond, near the battle-ground of Malvern hill. Several important actions were fought near this point in 1864, generally resulting favorably to the unionists.

DEEP RIVER, a tributary of Cape Fear river, North Carolina, rising in Guilford co., and running through Randolph and Chatham counties to join the Haw. Its length

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DEER, ETC.—1. Chough and Jack-daw. 2. Cuckoo. 3. Coati. 4. Civet. 5. Chinchilla 12. Cross-bill. 13. Crane's head. 14. Condor. 15. Black coot. 16. Diver.

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. 6. Moose. 7. Reindeer. 8. Hart. 9. Roebuck. 10. Musk-deer. 11. Skull of same.

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is about 120 m., and it is navigable as far as the coal-mines. The coal-beds in its valley have been long known, but little worked. Their productive area is more than 40 sq. m., and the total deposit estimated at 240,000,000 tons. The coal is in part highly bituminous, in part semi-bituminous, in part anthracite; all good. In places it is metamorphosed into graphite. Iron and copper ores are found near the coal.

DEER (Ger. *thier*, meaning "beast"—a sense which the Eng. *deer* once had, Gr. *thēr*, Lat. *fera*), a Linnæan genus of ruminant quadrupeds, now constituting the family *cervidæ*, which some naturalists have divided into a number of genera, whilst others still regard it as forming only one, the distinctions between its groups not seeming to them sufficiently marked or important for generic characters. Deer are animals of graceful form, combining much compactness and strength with slenderness of limb and fleetness. They use their powerful horns for weapons of defense, and sometimes of offense; but in general they trust to flight for their safety. They have a long neck, a small head, which they carry high, large ears, and large full eyes. In most of them there is, below each eye, a sac or fold of the skin, sometimes very small, sometimes of considerable size, called the *suborbital sinus*, *lachrymal sinus*, or *tear-pit*, the use of which is not well known. Deer have no cutting teeth in the upper, but eight in the lower jaw; the males have usually two short canines in the upper, but neither sex has any in the lower jaw; the præmolars are three, and the true molars three on each side in each jaw. They are distinguished from all other ruminants by their branching horns (antlers), which in most of the species exist in the male sex only; they are solid and deciduous, i.e., fall off annually, and are renewed with increase of size, and of breadth of palmation, and number of branches, according to the kind, until the animal has reached old age, when the size of the horns begins to diminish on each annual renewal. The size and development of the horns are indeed closely connected with the sexual system, and their annual renewal takes place just in time for the rutting season, when they are much used in fierce combats. Females with diseased ovaries sometimes exhibit horns like those of the male.

The horn of a deer is a continuation of bone from the outer table of the skull, and is at first clothed with a velvet-like covering (the "*velvet*"), continuous with the outer integuments of the head, which, however, is soon rubbed off—the animal appearing to be impelled by some irritation to rub it against trees or rocks—leaving the horn hard and solid, with traces of the course of the many vessels which were employed for its production. The growth of the horn is very rapid. When the old horn has been cast, there is a wound which bleeds a little, but is soon skinned over with a fine film, and the new horn almost immediately begins to sprout. Cast-horns are very rarely found in deer-forests, a circumstance that has never been quite satisfactorily accounted for. The growth of the horn is attended with much heat, and the blood-vessels which supply the head enlarge in size. The last part of the process is the formation of a rough circle of bony tubercles (the *burr* or *pearl*) at the base of the horn, bearing some proportion to the size of the horn and the age of the animal. It is by these, as they enlarge, that the nutritive vessels of the "velvet" are compressed and obliterated.—Deer are pretty uniformly clothed with hair, longer and thicker in those which inhabit cold, than in those which inhabit warm climates. The tail of all the species is short. The horns of some are broadly palmated, those of others are rounded; and importance has been attached in classification to their having or wanting a distinct *snag* or short branch projecting in front from the base of the antler; which is present, for example, in the stag, fallow-deer, reindeer, and axis, and wanting in the roebuck, elk, and cariacou. The broad palmation of the horns of species inhabiting the coldest climates has been supposed to be intended for turning over the snow in search of food. One of the most beautiful adaptations in nature is a peculiarity of the foot of the reindeer, by which the hoofs separate to a remarkable width, and the greater extent of surface prevents the foot from sinking in soft snow. Deer are found in almost all parts of the globe except Australia and the s. of Africa, their place in the latter region being supplied by antelopes in extraordinary number and variety. Some of them live amidst the snows of very northerly regions, and some in tropical forests; the greater number inhabit the warmer temperate countries, and they are chiefly found in wide plains and hills of moderate height, none dwelling on those lofty mountain summits which are the chosen abode of some animals of the kindred families of *antilopidæ*, *capridæ*, and *moschidæ*, as the chamois, the bouquetin, and the musk. The flesh (venison) of most kinds of deer is highly esteemed for the table, and they have long been regarded as among the noblest objects of the chase. Only one species, the reindeer, can be said to have been fully domesticated and reduced to the service of man; although individuals of many species have been rendered very tame.

See AXIS, CARIACOU, ELK, FALLOW-DEER, MUNTJAK, REINDEER, RUSA, STAG, WAPITI, etc.—The musk (q.v.), although sometimes called musk-deer, is not of the deer family.

DEER, or DEIR, OLD, a village and parish in the n.e. of Aberdeenshire, in the district of Buchan. Here are vestiges of a Cistercian monastery founded about the year 1219, by William Cumyn, earl of Buchan, on the site of a church believed to have been planted by St. Columba, and his disciple, St. Drostan, about the year 580. A few

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MSS. which had belonged to the monks of Deir, found their way, after the reformation, to the university library at Cambridge; and among them one has been recently discovered, which has come to be known among archæologists and philologists as the *Book of Deir*. It contains a copy of the gospels (in the Latin version of St. Jerome) and of the Apostles' Creed, in the handwriting of the 9th c., with a portion of a *Missa de Infirmis*, or "Communion of the Sick" (containing a Celtic or Gaelic rubric), in a later hand. On the blank leaves at the beginning, in the handwriting of the early part of the 12th c., are a few notes or memorials, in the Celtic or Gaelic language, recording "How Columcille and Drostan came from Hi to Aberdour, and how Bede the Pict, who was than Maormohr of Buchan, gave them the towns of Aberdour and Deir," and how succeeding maormohrs, chiefs of clans, kings, and others, added to the immunities and endowments of the church of Deir. These notes or memorials are of great philological interest, as the only known examples of the Celtic speech of Scotland in the 12th century.

DEERFIELD, a town in Franklin co., Mass., on the Connecticut river, and the Boston and Maine and the New York, New Haven, and Hartford railroads; 90 m. w. by n. from Boston. It was incorporated in 1677; contains more than 10 villages; is regularly built and well shaded; and is principally engaged in agriculture and the manufacture of pocket-books. There are a high school and public library. In 1675 it was the scene of an Indian massacre in which Capt. Lathrop and 84 men were caught in ambuscade and 76 of them killed, the captain included. In the winter of 1703, the French and Indians fell upon Deerfield, burned all except the church and one house, killed 36 people, and carried the remainder, 108, into captivity. They were hurried off towards Canada, but many were killed or died on the way. The survivors were liberated in 1706, but a daughter of Mr. Williams, the minister, refused her liberty, and married an Indian chief.

DEERGRASS, plants of the order *melastomaceæ*, eight species of which are found in the United States. The flowers are conspicuous and showy, having bright purple petals. It is sometimes called the "meadow beauty."

DEERING, a city in Cumberland co., Me.; charter granted 1889, accepted 1892; on the Maine Central, the Portland and Rochester, the Grand Trunk railroads, and the Portland street railroads 1½ m. from Portland. It includes several villages, has a high school, public library, Westbrook seminary, Keeley institute, and a weekly newspaper. Pop. '90, 5353.

DEER ISLE, a town in Hancock co., Me., 130 m. from Portland, embracing Great and Little Deer and Eagle islands, and having important fisheries, especially of lobsters. It was incorporated in 1789. Pop. '90, 3422.

DEER LODGE, a co. in n.w. Montana, bordering on British America; 5085 sq.m.; pop. '90, 15,155. It is the richest mining section in the State, and is also well adapted to grazing. Co. seat, Deer Lodge.

DEERMOUSE, or JUMPING MOUSE (*meriones*), a genus of American rodent quadrupeds allied to mice and to jerboas, and differing from the gerbils of the warm parts of the old world only in the greater length of their hind-legs, the nakedness of the tail, and the existence of a very small tooth in front of the molars of the upper jaw. The D. or jumping mouse of Canada (*M. Canadensis*), common in that country, and often seen in summer and autumn, is a beautiful agile little creature, of the size of a mouse, with a very long tail, and very long slender hind-legs. It is capable of taking leaps of four or five yards. It burrows, and passes the winter in a state of lethargy.—Another species, the Labrador jumping mouse (*M. Labradoricus*), inhabits the still more northerly parts of North America.

DEER-STALKING is the art of following the red deer by cautious maneuvering, for the purpose of shooting it with the rifle; and as practiced in the Highlands of Scotland, is perhaps unequaled as a sport in fatigue as well as in excitement. The extensive tracts of hill-land over which deer roam, and on which they are stalked, are termed "deer-forests," few of which, however, notwithstanding the appellation, can boast of a single tree; and where these "forests" belong to noblemen and others peculiarly addicted to the sport, deer are strictly preserved, to the almost total exclusion of sheep and cattle. This sport is more highly esteemed, and greater sums are paid for it by its devotees, than for any other in Scotland. This arises chiefly from two causes: 1st, from the intense excitement occasioned in the pursuit of the red deer; and 2d, from the comparative scarceness of good forests. Deer-stalking demands many expensive accessories, among which may be mentioned—deer-hounds, to pursue and bring to bay wounded game; one or more guides to accompany the stalker; and hill-men to *drive* the deer, when that method of obtaining shots is determined upon, etc. However excellent a marksman the deer-stalker may be, and though he may be tolerably conversant with the general "lie" and bearings of the ground, he is almost always accompanied by an experienced guide, upon whose cool judgment, keen eye, and thorough knowledge of every knoll and rock of the "forest," depends greatly his chance of obtaining a shot. A dress resembling in color as nearly as possible that of the ground to be gone over; a rifle of first-rate make, and previously practiced with at various distances; a deer-hound or more, that watch constantly in perfect silence for the slightest look or sign from their master; a robust constitution, to stand the fatigue of walking, crouching (sometimes in water), crawling, and advancing

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on the back, feet first, are some of the requisites the deer-stalker must possess. And when we add to these the most unflinching perseverance and untiring patience, we have not said all, for unless he is gifted by nature or experienced with *nerve* to take instant and careful advantage of the rare opportunities a day's stalk may offer, his previous care and toil must go for nothing. The deer-stalker should always be provided with a good telescope. The season for killing red deer begins on the 20th of Oct., and closes on the 9th of June. This sport depends more upon the vicissitudes of wind and weather than perhaps any other. Deer are gifted with very keen scent, a fact of which the stalker is well aware, and for which he must allow by advancing upon his game *up* the wind. They are also far-sighted, and exceedingly prone to take alarm at the slightest sound, faculties which warn the stalker never to let himself or his attendant be seen, and to observe the strictest silence. Deer, if disturbed, for the most part look for the cause as proceeding from the *low grounds*, and rarely from above; this peculiarity is duly taken advantage of by the sportsman, who accordingly advances upon his game, wind permitting (frequently by the most circuitous and precipitous paths), *down* hill. When thus approaching deer that are feeding in the valley below, the utmost caution is requisite, both as regards speed and the mode of progression. The stalker must advance inch by inch on his back, by resting himself on his elbows, and drawing himself forward by his heels; he must observe every motion of the deer, stopping when they stop feeding, and retaining his position, irksome though it be, till his game recommence pasturing; he must never, even for an instant, display the slightest unusual motion during his toilsome and stealthy advance, and must submit implicitly to every signal and whisper from his guide. During protracted stalks, especially when the nature of the ground between man and deer is free from sheltering knolls, the stalker's patience is tried to the utmost by his having to pause so frequently in his progress; the stalk, however, is usually directed not so much *directly* towards the deer, as for some intervening knoll or rock where a little relaxation of limb and breathing-time may be obtained ere firing. Thus, if fortunate in properly winding the deer, and if the stalk has been successfully accomplished, the herd may be reached within 50 or 100 yards. The game may possibly consist of either a single stag, or some hinds and one or two stags; the finest of the latter is usually the aim of the true stalker, and the most deadly spot to aim at is behind the shoulder. If mortally hit, the animal frequently bounds away for twenty or more yards, and then falls dead; if not mortally struck, it will sometimes fall at the shot, and spring up again, and follow the retreating herd. It is then the deer-hound is slipped. When a deer is killed, and cannot be immediately conveyed home, the attendant instantly disembowels it, that the venison may not be tainted. This operation is termed *gralloching*. The best stag in the herd is that which is the fattest, and has the finest antlers. See DEER. When there are more than one sportsman, or where the peculiarities of the ground are such as to render the task of stalking unusually difficult, hill-men are employed to drive the deer towards certain passes, behind which the shooters are previously concealed. On such occasions, the excitement produced by the gradually approaching and unsuspecting herd, mingled with the grandeur of the whole scene, as they at length rush through the fatal pass, is enough to try the nerves even of the most experienced stalkers. The Black Mount, belonging to the earl of Breadalbane, and the Forest of Athole, belonging to the duke of Athole, are the finest deer-forests in Scotland. The best work we know of on the subject of deer-stalking is Scrope's treatise, published in 1838; 3d edit. 1847.

DEER-STEALING. By 24 and 25 Vict. c. 96, s. 13, it is enacted that any person who shall unlawfully hunt, snare, or carry away, kill or wound any deer kept in the inclosed part of a park, chase, or other inclosure, shall be guilty of felony, and shall be liable to two years' imprisonment, and hard labor. If the deer be in the uninclosed portion of the park, the punishment is a fine not exceeding £50, which the justice may modify as he shall see fit. The second offense, in every case, is to be considered felony. Suspected persons found in possession of venison, or of the head or skin of a deer, or of snares or engines for taking deer, who shall not be able to satisfy the justice that they came lawfully by the venison, or had a lawful occasion for the snare, may be fined a sum not exceeding £20. A like penalty is imposed (s. 15) for setting engines for taking deer, and pulling down park-fences. By s. 16, deer-keepers and their assistants may seize the guns, snares, dogs, etc., of offenders who do not deliver them up on demand, and resistance on their part is declared to be felony. In Scotland, the offense of breaking into a deer-park and shooting deer is punishable as theft. Shooting a stray deer without the owner's consent, is punishable by fine. Though not entitled to kill deer trespassing on his property, the proprietor may drive them off (Stair, ii. 3, 68; Ersk. ii. 6, 14); and one of two co-proprietors may drive off deer against the will of another (Irvine, *Game-laws*, p. 13). There is a reference to deer in the present acts which regulate the duty on game licenses, and persons shooting them are always liable to the penalties imposed by these statutes. Hunting them with hounds is, however, excepted (see Paterson's *Game-laws*, p. 130). See GAME LAWS.

DE FACTO, a Latin phrase much used in English to express "in reality," or possession. A king *de facto* is one actually ruling, although the place may rightfully belong to another, who therefore is king *de jure*.

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DEFAMATION. See LIBEL.

DEFAULT, JUDGMENT BY. Where the defendant in a cause has failed to make appearance or to lodge a sufficient plea, or other pleading, in due time the plaintiff may proceed to sign judgment by default. Where a writ of summons has been specially indorsed (see INDORSEMENT), the plaintiff, on lodging an affidavit (q.v.) of the service, may immediately sign judgment by default, and in eight days from the last day for appearance, execution may issue against the defendant. If the writ of summons have not been specially indorsed, the plaintiff may file an affidavit of service, or notice in lieu of service, and a statement of the particulars of his claim, and may after the expiration of five days enter final judgment for the amount. Judgment by default, for want of a plea, etc., may in like manner be signed on failure of the defendant to deliver a sufficient plea in the prescribed time. Judgment by default is not necessarily final. In case of non-appearance, it will be set aside on the defendant making affidavit as to the cause of non-appearance, and disclosing a ground of defense on the merits. If judgment have been for want of a plea, etc., it may also in general be set aside on an affidavit of merits. But in both cases, the defendant must suffer the costs of the proceedings.

DEFEASANCE, DEED OF (in law). A collateral deed, made at the same time or in the same transaction with some other deed, and containing certain conditions or provisions upon the performance of which the estate then created or conveyed may be defeated or destroyed. It was by force of the operation of such a deed that mortgages were anciently made upon land. When an owner of land wished to obtain money upon the security thereof, he made a conveyance to the lender, which was *ex facie* absolute, but which was accompanied by a deed of defeasance. By virtue of the latter deed, the borrower, upon repayment of the money within the time stipulated, could recover his land. The two deeds being executed and delivered in one and the same transaction, and referring as they did to each other, were treated by the courts as one instrument. They are now generally both written in one instrument, and thus the form of the modern mortgage is produced. The conditional portion, thus incorporated into the one instrument, is now generally denominated the defeasance clause. The two parts may still be made as separate instruments, however, and are occasionally so drawn. A defeasance may also be made to accompany a lease for a term of years, or other instrument which does not purport to convey a freehold estate, but it is now rarely found outside of a mortgage.

DEFENDER OF THE FAITH, a title conferred on Henry VIII. by Pope Leo X., as a reward for writing against Martin Luther, in 1521. When the king afterwards suppressed the religious houses at the reformation, the pope not only recalled the title, but deposed him. The title was afterwards confirmed by parliament (35 Henry VIII. c. 3), and has ever since been used by the sovereigns of Gt. Britain. The corresponding title in Spain is, Most Catholic, and in France was, Most Christian King.

DEFENDER OF THE MARRIAGE TIE. An office created by Pope Benedict XIV., in the year 1741. Its object is, in all cases of actions for divorce, or any attempt to annul the marriage tie, to defend the marriage bond in its integrity. Marriage being a sacrament in the Catholic Church, is, like the other sacraments, most jealously guarded. The 'Defender,' or officer appointed to defend, is clothed by ecclesiastical authority, with the same, or similar powers, that the prosecuting attorney in civil law, in criminal procedure, is endowed. He usually acts as a referee in civil court procedure. The office was instituted in America by the Third Plenary Council of Baltimore in 1884, and is now extended until each Catholic diocese has its "Defender," ecclesiastically appointed, ready to defend the integrity of the marriage agreement before any court of proper jurisdiction. The first appointee in the United States, was the Rev. Dr. Burtsell (q.v.), who was appointed by Archbishop Corrigan, and elected by the synod of 1886.

DEF'ERENT, an old term in astronomy, signifying a circle on which the center of another circle moves, while a body is supposed to be moving on the latter itself. If we suppose the sun to be moving round a center in space, while the earth moves, say, in a circle round the sun, then the sun is moving in the deferent. The term originated in the Ptolemaic system (q.v.).

DEFFAND, MARIE DE VICHY-CHAMROND, Marquise du, 1697-1780; a leader in the fashionable literary society of Paris during the greater part of the 18th century. She was born of a noble family in Burgundy, and educated in a convent in Paris, and soon developed the cynical and skeptical turn of mind which so well suited the part she was afterwards to fill in the philosophical circles of the capital. At the age of 21, her parents married her to the marquis du Deffand, without consulting her inclinations. The union was unhappy, and a separation soon followed. Young and beautiful, she did not, according to the common belief, keep herself uncontaminated by the abounding vices of the age, and it was said that she was for a time the mistress of the regent. A reconciliation with her husband was made, but of short duration. Without heart and without enthusiasm, she was incapable of any strong attachment; but her intelligence, her cynicism, and her *esprit*, made her the center of attraction to a circle which included nearly all the famous philosophers and literary men of Paris, besides not a few distinguished visitors from abroad. In 1752, she became blind, and took up her abode in apartments in the convent of St. Joseph, her rooms having a separate entrance from the street. This became the frequent resort of such men as Choiseul, Boufflers, Montes-

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quieu, Voltaire, D'Alembert, David Hume, and Horace Walpole. In 1764, the society was divided into two parties by the defection of her companion, Mlle. de L'Espinasse, who took with her D'Alembert and several others. Madame Deffand had most affinity of nature with Walpole, who made several visits to Paris for the purpose of enjoying her society, and who maintained a close and interesting correspondence with her for 18 years. Of her innumerable witty sayings, the best known is her remark on the cardinal de Polignac's account of St. Denis' miraculous walk of two miles with his decapitated head in his hands: "It is only the first step that costs."

DEFIANCE, a co. in n.w. Ohio, on the Indiana border, intersected by the Miami canal, and the Baltimore and Ohio and the Wabash railroads; 414 sq. m.; pop. '90, 25,769. The surface is level and timber is abundant. Chief productions, wheat, corn, oats, butter, wool, tobacco, etc. Co. seat, Defiance.

DEFIANCE, a city and co. seat of Defiance co., O., on the Maumee river, at the junction of the Auglaize, 51 m. w.s.w. of Toledo. There are several flouring mills and other manufacturing establishments, and the city has a large river shipping trade in agricul tural products, live-stock, etc. Pop. '90, 7694.

DEFICIENT NUMBERS. A number is said to be deficient whose aliquot parts, or factors, added together, make a sum less than the number itself: thus, 16, whose parts, 1, 2, 4, 8, make together only 15, is a deficient number.

DEFILADING is that part of the art of fortification which consists in determining the directions and heights of the lines of rampart, so that the interior may not be commanded by the fire of any works which the enemy may raise. Defilading is divided into horizontal and vertical. The object of the first is to prevent the lines being commanded in the direction of their length, or enfiladed; the prolongations of the lines, therefore, must avoid all points where hostile works could be erected. Vertical defilading determines the height of rampart necessary to protect the interior from direct fire.

DEFILE, in military language, is the name given to any passage which is of such a nature that it must be traversed by troops only in column with a narrow front. Wherever free lateral movement is obstructed, is a defile; and a defile is a "pass" when it cannot be avoided, without making a long circuit.

DEFINITE PROPORTIONS, LAWS OF, in chemistry. See ATOMIC THEORY.

DEFINITION is the explanation or statement of the meaning of a word, viz., either the meaning it usually bears, or that which the speaker or writer, for the particular purposes of his discourse, intends to annex to it. To give merely another synonymous name—to say, for instance, that "man is a human being"—is not commonly considered a definition at all. Names requiring definition mostly imply, or connote, a set of attributes. To define such a name, then, is to enumerate all the attributes connoted by it. Hence, definition is a kind of analysis. If we were to define "man" as "a rational animal," the definition would be imperfect; for no one would call such beings as Swift's Houyhnhms men, which shows that, in the common acceptation of the word man, it connotes among other things a certain form. Definition, then, is of the nature of essential propositions; it conveys no information about the object to any one who is aware of the connotation of its name; it is only a statement of all the attributes, the absence of any one of which would make the object cease to be called by that name.

The definition, "Man is a rational animal," though incomplete, is correct so far as it goes; though it does not enumerate all the essential attributes—i.e., all the attributes connoted by the name man, yet those it does enumerate are connoted by the name, and are sufficient to mark out its denotation—that is, to distinguish all the beings known to exist to whom it can properly be applied. Such is generally held, therefore, to be a complete definition, though logically imperfect; but to say that "Man is a featherless biped," involves a different kind of imperfection. The attribute featherless, though actually true of all men, and therefore serving to distinguish them from the only other bipeds, the birds, is no part of the meaning of the word, but is what logicians call an *accidental* attribute. This kind of imperfect definition is called a description. Such definitions are very common in science, and serve special purposes of classification. In Cuvier's *Animal Kingdom*, man is defined or described as "a mammiferous animal having two hands."

A distinction is generally drawn between definitions of names and definitions of things, or *nominal* and *real* definitions. A real definition is intended, it is said, "to explain and unfold the nature of the thing." In objection to this view, it is replied, that no definition can unfold the whole nature of a thing, and every true proposition respecting it unfolds some part of its nature: of all the propositions, then, unfolding its nature, how shall we distinguish those that define it from the others? This question has never been answered. The fact seems to be that "all definitions are definitions of names, and of names only," but that many expressions that pass for definitions, are something more. They not only define the name of the thing, but they comprise a tacit assumption, that a thing with such attributes does or may exist. This is the case with the definitions of geometry; and it is from these tacit postulates that the consequences are deduced, and not from the mere definition of the meaning of a word.

As there can be no accurate discussion unless all the terms employed have a distinct

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meaning recognized by all parties, it is often necessary to have recourse to formal definitions of important names. One of the most effectual devices ever yet discovered for settling the signification of terms, is to declare the meaning *opposed* to what is intended; in this way any ambiguity in the language is at once done away with. Thus, the word "natural" conveys no clear meaning of itself; but if we state what we mean to *exclude* when we use it, we narrow the variety of significations to some one. We may oppose it to "moral," and then it means something connected with the world of matter; we may oppose it to "constrained" or compelled, giving it the meaning of spontaneous or free; other contrasts are the "artificial," the "distorted," in copying or representing things, etc.

The scholastic logicians made definition consist in stating, first, the "genus" that a thing belonged to, and secondly, the "difference" or peculiarities that separate it from all the other members of the same genus. This suits for natural history, and for all subjects analogous thereto. For example, if we were attempting to define "poetry," we could not do better than proceed *per genus et differentiam*. Poetry belongs to the class of fine arts: it has all the characters common to painting, sculpture, architecture, music, etc. Consequently, if we are well acquainted with these other subjects, we can draw from them part of the characteristics that belong to poetry; for example, its having for its end refined pleasure. We then inquire into the *difference* between it and the others, which we find to be the use of a peculiar medium or instrumentality—viz., thoughts expressed in language. If we would give a more particular account of the meaning, we should find it necessary to specify the *kinds* of poetry, or to find out the *differences* of epic, dramatic, lyric, etc.; which would be to define, not the subject itself, but its subordinate species.

DEFLAGRATION is applied to the rapid combustion of ignited charcoal when a nitrate (such as nitrate of potash) or a chlorate (such as chlorate of potash) is thrown thereon. As chlorates do not occur naturally, it follows that deflagration with a natural salt indicates a nitrate; and if the deflagration be accompanied by a violet flame, it is characteristic of nitrate of potash (ordinary niter or saltpeter); and if by a strong yellow flame, it is indicative of nitrate of soda (cubical niter).

DEFLECTION is, generally, a change of course or line of motion of a moving body. The word deflection is also used as synonymous with diffraction (q.v.).

DEFLUXION (Lat. *defluxio*), a discharge from a mucous membrane, especially of the air-passages. It is synonymous with catarrh (q.v.).

DE FOE, DANIEL, was b. in London, 1661, and was the son of James Foe, a butcher. The prefix De was not added to the family name of Foe by our author until he had reached manhood. De F., whose father was a dissenter, was educated at a dissenting academy at Newington Green, where he remained until he had nearly reached the age of nineteen. In 1682, he began his career as author, publishing a pamphlet which contained strictures upon the clergy of that day. This was followed, in 1683, by another pamphlet, entitled *A Treatise against the Turks*. In 1685, he took part in the rebellion of the duke of Monmouth, but luckily escaped being punished on its suppression. After this he engaged in trade, but a series of misfortunes finally determined him to forsake it.

In 1701, he published his famous satirical poem, *The True-born Englishman*, which was written in vindication of king William, and in answer to a poem in which he had been attacked, called *The Foreigners*. This poem proved a wonderful success; 80,000 pirated copies of it were sold on the streets at a trifling price. During the same year, when the deputation that presented the famous petition of the freeholders of Kent to the house of commons were illegally thrown into prison, De F. drew up, a few days after, a remonstrance, known in history as the *Legion Memorial;* and is said to have himself, in the disguise of a woman, presented it to the speaker as he entered the house. In 1703, a complaint being made in the house of commons regarding one of his recent publications, called *The Shortest Way with Dissenters* (1702), the whole tenor of which seems to have been misunderstood, he was apprehended, tried, found guilty, pilloried, fined, and imprisoned. While in prison, he wrote a *Hymn to the Pillory;* and here also he projected *The Review*, a periodical which he established on his release in Aug., 1704, and continued to conduct for nine years. In 1706, lord Godolphin, who admired the practical talent and literary vigor of De F., employed him as one of the staff of the commissioners to Scotland to bring about the union. De F.'s knowledge of revenue, trade, and taxes was found to be of great value; and it is supposed that he was rewarded with a pension for his services on that occasion. His visit to Scotland enabled him to write a *History of the Union*. For some years after, De F. seems to have lived in comfortable circumstances, but gradually his numerous political enemies gathered voice again, and De F. was literally silenced by noise and obloquy; at last, however, roused by the insolence of the Jacobite party, he was once more tempted to write unwarily, and the result was that he was again (1713) apprehended, fined in £800, and committed to Newgate. After his release, De F. became sick of politics, and, fortunately for the world, sought rest in the sphere of imaginative literature. In 1719, appeared the famous *Robinson Crusoe*—the most popular of all his works. Its success was immediate. The publisher, who had accepted the book after all the others had refused it, is said to have cleared £1000 by its publication—no small sum in those days. De F., in rapid succession, pro-

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duced his other notable works of fiction. *Moll Flanders* (1721), *Journal of the Plague* (1722), *Colonel Jack* (1721), *Adventures of Roxana* (1724), and the *Memoirs of a Cavalier*, the last of which Chatham used to recommend as the best account of the civil wars extant, bear witness to De F.'s industry during these years. He died in April, 1731 D.'s style, both in his political and imaginative works, is simple, clear, and vigorous. His fictitious narratives are characterized by an unparalleled appearance of truth. This is pre-eminently the case in the *Journal of the Plague*, which for a long time imposed upon the well-known Dr. Mead as genuine. See *Life and recently discovered Writings of De F.*, by Lee.

DEFORCE'MENT, in English law, is an ouster of the freehold (q.v.). It is the holding of any lands or tenements to which another person has right. In this sense, it includes as well an abatement, intrusion, disseisin, or discontinuance, as any other species of wrong whatsoever, whereby he that hath right to the freehold is kept out of possession. But in its strict sense, it is only such a detainer of the freehold from him that hath the right of property, but never had any possession under that right, as falls within none of those injuries.—*Co. Litt.*, by Butler, 331 b. n. (1). The party thus wrongfully retaining possession was called the deforciant, and was said by Blackstone (2 *Comm.* 196) to have an *apparent right of possession*. There was this difference between a party retaining possession of the freehold by means of deforcement, and one who occupied by either of the other modes of ouster, that in the former case the party ousted had no right of entry (q.v.). This, previous to the reign of William IV., was a matter of some importance, inasmuch as the claimant was thereby debarred from recovering possession by means of entry or ejectment, and was driven to the more tedious process of asserting his right by a real action (q.v.). But by 3 and 4 Will. IV. c. 27, all real actions, except four, having been abolished, this distinction between deforcement and the other means of ouster has ceased to have the same practical importance.

DEFOR'CIANT, a title of the defendant in a suit for levying a fine of lands (q.v.).—The party wrongfully retaining possession of a freehold by deforcement (q.v.).

DE FOREST, JOHN WILLIAM, b. Conn., 1826. While yet young, he passed several years in Europe and western Asia. In the war of the secession he served as captain of volunteers, and was promoted to major. For a time he was commander of what was known as a "Freedman's bureau district." Among his books are *Oriental Sketches; European Acquaintances; Seacliff; The Wetherel Affair; Miss Ravenel; Overland;* and *Kate Beaumont*.

DEFORMITIES. Varieties of form which mar the external appearance, may be *congenital* or *acquired*, according as they occur before or after birth. The former class were considered by the ancients to carry some important meaning in their mysterious shapes, and to show the anger of the gods; hence, they termed them *monsters*, from *monstrare*, to show; and even in later times, they were popularly believed to be the result of the most hideously unnatural combinations. Modern scientific writers have, however, made them a subject of special study, under the name teratology (*teras*, monster, and *logos*, science), and their researches have shown that D. generally depend on some arrest of development of the fetus, or some accidental position it has got into, or some inflammatory disease which has caused unnatural adhesion of parts. It has been found that in 3,000 births in Paris, there occurs about one monster. They generally follow some definite law. D. are more common among domestic than wild animals, among mammalia than birds, and very rare among fishes and the invertebrata.

It is a common belief, that the mind of the female parent has an influence over the shape of her infant; but although some singular coincidences have occurred, there is no scientific proof that such is really the case. This theory, however absurd, was eagerly adopted in the middle ages; it was, in fact, often appealed to in the interest of mercy as a loophole of escape for pregnant women, who, by the barbarous ignorance of the time, might be condemned to torture; and so universal has the popular belief in this theory become, that even at the present day no scientific demonstration to the contrary has proved sufficient to undermine it. D. are, however, in many cases, hereditary, as may be seen in the instances of additional fingers and toes, and of harelips.

It seems uncertain whether the male or female parent chiefly influences the occurrence of deformity in the offspring. One rarely sees a case of harelip without being able to recognize a sort of tuck or shortening in the same feature of the mother; but the writer of this article knows a family of three with harelips, whose father alone is similarly deformed; and another family of three, with perfectly formed mouths, whose mother has an uncured and extremely unsightly harelip.

The chief congenital D. may be classed under the following heads:

Deformity as regards *number* of parts; as, for instance, the Sirens, who have *apparently* but a single inferior extremity, which tapers to a point; the Cyclops, with but one eye; or the head itself may be absent, or some organ, as the brain. Such D., from a deficiency of parts, may also result from amputation of portions of the limbs of the fetus when still within the uterus by the pressure of the umbilical cord. Curiously enough, however, it often happens that this intra-uterine amputation of parts leads indirectly to an exactly opposite condition—namely, a multiplication of parts arising from the stumps left by these uterine amputations; the fetus in the early

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stages of its growth appearing to possess something of the power of reproduction of parts observed in most of the lower orders of animals. The parts most commonly reproduced are fingers and toes, or, most commonly of all, only abortive portions of these, as little projections from the stump of the limb, with traces of nail, and sometimes a single joint with an imperfect bony development. We see a new growth of little fingers or toes according to the member lost, and this power shows itself sometimes without being preceded by such an injury, in additional fingers, toes, etc. These parts are generally close to the similar natural ones, but not always, as, for instance, an ear in the neck.

Deformity with regard to *size*. This may involve the whole body, as in dwarfs, of whom there have been some remarkable peripatetic specimens: the Corsican fairy was only 2 ft. 7½ in. high; Mlle. Crachami, the smallest lady who ever lived, died at 10 years of age, only 20 in. in height. This kind of deformity is not necessarily hereditary; the father of Borowlaski, who was only 39 in. when 30 years old, had six children alternately short and tall; and dwarf women have brought forth infants as long, when extended, as their mothers. One limb only may be diminutive. Of course, D. the opposite of these exist, such as giants, or instances of premature or excessive local growth. O'Byrne, the Irish giant, measured 8 ft. 4 in. when he died, at the age of 22. Such individuals are generally subject to premature decay.

Deformity as regards *shape;* this results generally from retarded growth, the parts of the embryo not consolidating as growth advances, as in harelip; or from irregular muscular contractions, as in club-foot (q.v.); or by two or more parts coalescing, as two fingers; or in cyclopy, when both the eyes run into one.

D. of *color* are frequently coexistent with tendency to, or the presence of, some disease. There may be deficiency of coloring matter, as in albinos; or an apparent increase, as in *blue disease*, arising from the partition between the right and left sides of the heart not being completed; or from some coloring matter produced in the body, as in the mottled individuals shown in caravans.

D. of *continuity* occur from the lateral halves of the embryo not completely closing, as seen in clefts of the back, the palate, etc.

Acquired deformities will be noticed under their special names.

DEFREGGER, Franz, an Austrian painter; b. 1835, at Stronach, in the Tyrol. He gave early evidence of talent, but had no opportunity for instruction till 1860; when, after studying drawing with the sculptor Stolz at Junsbrack, he was admitted to the Munich academy of fine arts, and afterwards, 1863–65, pursued his studies in Paris. In 1867, he began a series of paintings illustrating scenes of everyday life in the Tyrol that have justly made him famous. Among the best known are: "The Forester Returning Home for the Last Time;" "Wrestlers in the Tyrol;" "The Poachers;" "Dancing on the Alin;" and "The Last Call of 1809." He stands high among living genre painters.

DEFTER-DAR, a title of the Turkish minister of finance, who has a seat in the divan and disburses the public money. The title may be translated "book-keeper."

DEGER, Ernst, b. 1809; a German painter who studied at Düsseldorf under Von Schadow. He painted the frescos in the church of Apollinaris on the Rhine; on the completion of which William IV. employed him to adorn the chapel in the castle of Stolzenfels. He held for a number of years a professorship in the academy of fine arts in Munich. He d. in 1885.

DEGERANDO, Jos. Marie, Baron, author and philanthropist, was b. 29th Feb., 1772, at Lyons, France. His family was originally from Italy. He studied at the college of the Oratoire of Lyons, with a view to becoming a priest; but the persecutions of the revolutionists altered his plans. In 1797, he went to Paris. The *coup d'état* of the 18th Fructidor compelled him to flee to Germany, where he entered the army of Massena as a common soldier. While at Colmar with his regiment, D. wrote a treatise, which was "crowned" by the academy, and which was afterwards enlarged and published under the title of *Des Signes et de l'Art de penser, considérés dans leurs Rapports Mutuels* (Par. 1800). In 1802, appeared his *De la Génération des Connaissances Humaines*, a precursor of his *Histoire comparée des Systèmes de Philosophie relativement aux Principes des Connaissances Humaines* (Par. 1803; German, by *Tennemann*), which is reckoned the best French work on the history of philosophy. It procured him, in the following year, admission into the académie des inscriptions et des belles-lettres. About the same time, he was appointed secretary-general to the ministry of the interior, and subsequently held a variety of high offices under Napoleon. But D. is even better known, and has done more service, by his philanthropic than his philosophic writings. To the former class belong his excellent work, *Le Visiteur du Pauvre* (Par. 1820), which obtained the Montyon prize, as did also his *Du Perfectionnement Moral*, etc. (Par. 1824); his *Cours Normal des Instituteurs Primaires* (Par. 1832); *Institutions du Droit Administratif* (Par. 1835); *Éducation des Sourds-muets de Naissance* (Par. 1827); *Des Progrès de l'Industrie* (1841). D. was elevated to the peerage in 1837, and died 12th Nov., 1842, vice-president of the council of state.—His son, A. Degerando, has written two interesting works—*Essai Historique sur l'Origine des Hongrois* (Par. 1841); and *Transylvanie et ses Habitants* (Par. 1845).

DEGRA'DED, in heraldry, means placed upon steps or degrees, as in a *Cross Calvary*.

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DÉGRAS is grease obtained in the process of oil-tanning of skins and hides. In this method of tanning, fish, or train-oil is used, and also the grease obtained in cleaning and preparing wool for spinning. Oil-tanned leather, after going through the process and the manipulations of tanning, takes up more grease than it can hold and is necessary for tanning. The excess of grease is removed by pressing and washing, and the grease so obtained is called dégras.

In the process of oil-tanning, the fatty matter used undergoes certain chemical alterations which make it peculiarly adapted for dressing regularly tanned leather; and the demand for dégras for the latter purpose is greater than can be supplied from the by-product of oil tanning. Dégras is therefore regularly manufactured by subjecting the same skins over and over to the oil-tanning process simply with the object of obtaining dégras.

DEGREE, in a college or university (Fr. *degré*, from Lat. *gradus*, a step), is a recognition of the student having made a certain step in advance, and having attained, as it were, to a certain resting-place in his academical career. The evidence of a D. is usually called a diploma (q.v.). Degrees may be divided into various classes, according to the privileges which they confer. 1. They are either simple certificates of attainment granted by a competent authority; attesting either that the college or university granting them has ascertained the fact by examination—in which case they are ordinary degrees—or that the common fame of the individual is such that the learned body conferring the D. is willing to take it for granted, in which case they are honorary degrees To this class belong our degrees in arts, and the honorary degrees of LL.D., D.C.L., and D.D., which are granted by most universities. 2. They are licenses to teach the branch of knowledge with which the holder is certified to be acquainted. To this class belonged all doctors', and probably all masters' degrees in the universities of the middle ages. See DOCTOR. 3. They are licenses to practice a certain profession or art. As the latter privilege is one in which the general community is more deeply interested than in either of the others, it is generally requisite to its full exercise that the university D. should be accompanied by a government license. These latter degrees—of which the D. of M.D. and D.C.L. (see DOCTORS-COMMONS) are the only ones known in Gt. Britain—in this case resolve themselves into one or other of the former classes.

University degrees, like most institutions which have held their place in society long, arose out of public exigencies, and are not traceable to any single founder or to any single act. There is every reason to suppose that, substantially, they have existed for ages. The doctors or teachers of the law (*nomodidáskaloi*), so often mentioned in the New Testament—and probably the scribes also—were a class, taken, it would seem, very frequently from the sect of the Pharisees, but essentially distinct from them (Luke v. 17), possessing privileges very closely resembling those which were attached to the D. of a teaching doctor in after times. In classical Greece, though far less formal than it afterwards became, education was probably more systematic than is commonly supposed. In the schools of Isocrates and Plato, Mr. Kirkpatrick, in his ingenious book on the *Historically-received Conception of the University*, has traced not only substantially the function, but much even of the external organization of the university. He has shown also, very clearly, that it was the systematic training which had become necessary for success in public life that called the Sophists into existence, and gave to them the marvelous social influence which they possessed. It was the ambition, not of the higher class of orators and statesmen alone, but of every noisy demagogue who aspired to notoriety, to come before the public with the prestige of having been the pupil of some famous Sophist, or, as we should say, of having been to a good school, and taken a good degree. All the appliances of modern teaching existed unquestionably in the museum at Alexandria, and it is inconceivable that those who had passed through the *kuklos* or cycle of studies, should not have carried away some testimonial of proficiency very much resembling a degree. As there was a distribution both of teachers and students into what we should call the faculties of philosophy, philology, and medicine, it is probable, moreover, that there were distinct degrees corresponding to each of them. During the three centuries which intervened between Alexander and Augustus, Athens continued to be the great school of philosophy, as Rhodes was of oratory, and Alexandria of philology and medicine. The importance of an education in the Greek schools rather increased than diminished during the period of the Roman empire. So entirely, indeed, was the success of the young provincial in public life also dependent upon his literary acquirements, that, as Mr. Kirkpatrick informs us, students, before leaving the provinces for Rome, were obliged to obtain a written permission from a magistrate, and that a record of the proficiency of each student was sent in to the government, in order that the latter might be thereby guided in the selection of fit individuals for the public service. In Constantinople, moreover, down to the very last, lifeless and unproductive though the intellectual life unquestionably was, it was formally organized to an extent which reminds one of China rather than of any existing European nation. The worthless and contemptible Byzantines, male and female, like the Chinese, passed endless examinations, and took abundance of degrees. After the incursion of the northern nations, the extreme rudeness of the general community of western Europe caused the learned class to stand out from it with a prominence unknown in the society of antiquity, and hence the greater importance which academical degrees assumed in the middle ages. A man who had passed through the trivium or quadrivium at Constantinople before barbarism had made

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learning rare, or who had received the far higher instruction which was communicated at the museum of Alexandria, by no means differed from the society which surrounded him to the same extent as did a master or a doctor at Paris or Bologna. The minuter history of academical degrees in the middle ages is involved in much obscurity. The following are passages from the above-mentioned work of Mr. Kirkpatrick, who has gone over the authorities with much care. "Wood mentions (*Hist. and Antiq. of Oxford*, i. 50) that St. John of Beverley (680 A.D.) was commonly reported to have been the first who took the D. of master of arts at Oxford. The same writer informs us that this D. had become common in the reigns of John and Richard I. According to Bulæus (*Hist. Univ. Paris*, ii., pp. 256, 679, sqq.), academic degrees were first instituted at Bologna. The forms designative of the various orders of academic dignity in that university are stated to have been the Baccalaureatus, Licentiatus, and Doctoratus. Of these, the last two were probably equivalent to the degrees of the master incipient and the magister socius or regent of Paris. Certain stadia, or successive courses of legal study, are said to have been in existence from the time of Justinian. The five years devoted to the acquisition of juristic knowledge were divided into the Anni Justiniani, edictales, papinianistæ, lytæ, and prolytæ. The student who had passed through all successively was described as a licentiatus, from the circumstance that he was considered qualified to discharge the duties of an antecessor or public professor of this subject. The practice adopted in this respect by the schools of jurisprudence was afterwards transferred to theology at Paris by Peter Lombardus. The name bachelor is supposed by Malden (*History of Universities and Academic Degrees*, p. 23) to have been borrowed from the terminology of the military hierarchy of those ages." See BACHELOR. "Bachelors are often styled scholars (Wood, *Hist. and Antiq. of Oxford*, i. p. 59), and the individual invested with this D. was regarded as, at the utmost, an imperfect graduate. At the same time, in accordance with the system of mutual instruction so thoroughly adopted in the schools of the middle ages, the more advanced class of scholars were both encouraged and commanded to perfect their own acquirements, and extend the educational influences of the university into the minutest ramifications of the system by teaching and catechising the junior members of their own body (Crevier, *Histoire de l'Université de Paris*, ii. p. 160) Bachelors, though thus intrusted with certain tutorial functions, never possessed any of the legislative powers assigned to the masters" (pp. 206, 207). It was to the teaching masters—and all who took the master's D. were bound to perform the duties of tuition for a time—that the term regent was applied both on the continent and in Scotland. On retiring from the office of regent, the master—at Paris, at least—ceased to take an active share either in the legislation or the government of the university (Bulæus, par. iii. p. 420). The question as to whether the institution of teaching masters or regents ought to be revived, to the extent of permitting them to compete on equal terms with the endowed professors, is one that was in former years under discussion in Scotland. In the German universities, the Doctor, by a *Habilitation* thesis, qualifies himself to lecture in the university as *privat docent;* and from amongst the *docents*, the professors are usually chosen. See BACHELOR, MASTER OF ARTS, DOCTOR, REGENT, UNIVERSITY, COLLEGES.

DEGREE, in music, is the difference of position or elevation of the notes on the lines and spaces. When notes are on the same line or space, they are on the same degree, even though one of the notes should be raised by a sharp, or lowered by a flat. When two notes follow diatonically, so that one of them is on the line, and the other on the space adjoining, the interval is of one degree. Subtracting one from an interval, gives the degrees which separate the two notes; thus, a third is separated by two degrees; a fourth, by three, etc.

DEGREE. See CIRCLE.

DEGREE OF LATITUDE is a space along the meridian (q.v.) through which an observer must pass to alter his latitude by one degree—i.e., in order to see the same star one degree nearer to or further from the zenith. See LATITUDE. The space must be found by actual measurement; and owing to the earth being an oblate spheroid, and not a sphere, it varies with the place of observation—the degrees being generally longer towards the poles, where the earth is flatter, and shorter at the equator, where the earth is more curved. If the earth were a sphere, a degree would be exactly a 360th part of the meridian. As it is, the length of a degree of latitude depends on the latitude of the place. From a variety of observations conducted at various times and places, from as far back as the time of Eratosthenes (250 B.C.), tables have been constructed showing the length of degrees at different latitudes. The length of "the middle degree," as it is called, or that of places in latitude 45°, may be taken approximately at $69\frac{1}{10}$ English miles. The ascertained differences between degrees of latitude is one of the proofs of the earth's spheroidicity. See GEODESY.

DEGREE OF LONGITUDE is the space between two meridians that make an angle of 1° at the poles, measured by the arc of a circle parallel to the equator passing between them. It is clear that this space is greatest at the equator, and vanishes at the poles; and it can be shown that it varies with the cosine of the angle of latitude. The annexed table shows the lengths of a degree of longitude for places at every degree of latitude from 0° to 90°. It is computed on the supposition that the earth is a sphere.

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Degree lat.	English miles.	Degree lat.	English miles.	Degree lat.	English miles.	Degree lat.	English miles.	Degree lat.	English miles.	Degree lat.	English miles.
0	69.07	16	66.31	31	59.13	46	47.98	61	33.45	76	16.70
1	69.06	17	65.98	32	58.51	47	47.06	62	32.40	77	15.59
2	69.03	18	65.62	33	57.87	48	46.16	63	31.33	78	14.35
3	68.97	19	65.24	34	57.20	49	45.26	64	30.24	79	13.17
4	68.90	20	64.84	35	56.51	50	44.35	65	29.15	80	11.98
5	68.81	21	64.42	36	55.81	51	43.42	66	28.06	81	10.79
6	68.69	22	63.97	37	55.10	52	42.48	67	26.96	82	9.59
7	68.48	23	63.51	38	54.37	53	41.53	68	25.85	83	8.41
8	68.31	24	63.03	39	53.62	54	40.56	69	24.73	84	7.21
9	68.15	25	62.53	40	52.85	55	39.58	70	23.60	85	6.00
10	67.95	26	62.02	41	52.07	56	38.58	71	22.47	86	4.81
11	67.73	27	61.48	42	51.27	57	37.58	72	21.32	87	3.61
12	67.48	28	60.93	43	50.46	58	36.57	73	20.17	88	2.41
13	67.21	29	60.35	44	49.63	59	35.54	74	19.02	89	1.21
14	66.95	30	59.75	45	48.78	60	34.50	75	17.86	90	0.00
15	66.65										

DEGREES OF LAMBETH. By 25 Henry VIII. c. 21, sundry powers formerly belonging to the pope were conferred upon the Archbishop of Canterbury, among which was the right of granting degrees. He can confer all the degrees taken in the universities of Oxford and Cambridge, but his degrees do not carry with them all the privileges which belong to degrees conferred by the universities.

DEGREES OF NOBILITY. See NOBILITY.

DEGREES OF RELATIONSHIP. See CONSANGUINITY, AFFINITY.

DE HAAS, MAURICE FREDERICK HENDRICK, a Dutch painter, b. Rotterdam, 1830, a pupil of Lewis Meyer. In 1859, he emigrated to New York, where he soon gained a high reputation. Marine views are his *forte*. His best-known American picture is "Farragut Passing the Forts." He died in 1895.

DEI GRA'TIÂ (Lat. "by the favor of God") is a formula taken from several apostolical expressions in the New Testament. It is believed to have been first formally used by the bishops at the council of Ephesus, 431 A.D. Afterwards, it came to be appended by archbishops, bishops. abbots, abbesses, deans, monks, and even chaplains, to their titles, in letters, and other documents, as a humble expression of dependence on the Most High. After the middle of the 13th c., when the sanction of the pope began to be considered necessary to ecclesiastical offices, the higher clergy wrote *Dei et Apostolicæ sedis gratiâ*, "by the favor of God and the apostolic see." At a later period, many of them preferred to write *miserationè divinâ, permissione divina*, and the like; but they still continued to be styled by others *Dei gratiâ*. In the British islands, this style was generally dropped about the time of the reformation, but it was occasionally given to the archbishops of Canterbury and York, even after the beginning of the 17th century. Beginning with the times of the Carlovingians, many temporal princes, earls, and barons made use of the formula D. G.; and before the 15th c., no idea of independence or of divine right seems to have attached to it. But in 1442, king Charles VII. of France forbade its use by the comte d'Armagnac, and in 1449, obliged the duke of Burgundy to declare that he used it without prejudice to the rights of the French crown. These instances show that it had now begun to be regarded as belonging exclusively to sovereigns who owed no allegiance to any other earthly potentate or power. In this way, what was originally a pious expression of humility, came to be looked upon as an assertion of the doctrine of the "divine right" of kings.

DEINOTHE'RIUM. See DINOTHERIUM.

DEIRA (Keltic, *dyfer*), an ancient Kingdom of Britain, corresponding closely to the modern Yorkshire. At the time of the Saxon invasion, Deira and its northern neighbor, Bernicia (Keltic Byrneich), were held by the Britons. Though it is probable that at the beginning of the sixth century they belonged to a confederation of Cumbrian states, in the course of that century they seem to have become Anglican states, apparently without any serious displacement of the population or even of the ruling families. Deira extended from the Tees to the Humber, and westwards to the borders of Cumbria. Subsequently, Deira and Bernicia were united to form the Kingdom of Northumbria (q.v.), but at a later date again both were earldoms under the West Saxon kings. In Deira was situated *Eboracum* (York), the capital of Britain under the Romans.

DE'ISM, or **THE'ISM,** properly means belief in a God, as opposed to atheism. In common language, however, D. is opposed to belief in a revelation; and a deist is one who holds the existence and providence of God, but grounds his belief on reason and the evidence afforded by the constitution of things, and rejects the testimony of a revelation. The name is often used vaguely by way of reproach, similarly to "infidel."

The term deists, or freethinkers, is sometimes used to designate a school or series of writers who appeared in England in the 17th and 18th centuries, and who aimed at establishing what they called natural religion, upon the basis of reason and free inquiry, and then bringing all positive or revealed religion to the test of this. They are looked upon as the precursers of German rationalism in theology. The leading names in this school are lord Herbert of Cherbury (d. 1648); John Toland, whose *Christianity not*

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Mysterious (Lond. 1696) gave exact expression to the tendency of the deists; lord Shaftesbury; Anthony Collins (d. 1729), the friend of Locke; Thomas Woolston; Matthew Tindal, the author of *Christianity as Old as the Creation, or the Gospel a Republication of the Religion of Nature* (Lond. 1730); viscount Bolingbroke.

DEJANI'RA, or DEIANEIRA, in Greek mythology, daughter of a king of Ætolia, and wife of Hercules. She soaked her husband's tunic in the blood of Nessus, the centaur, and Hercules was thereby poisoned. He could not endure the agony, and threw himself on a funeral pile, and perished.

DÉJAZET, PAULINE VIRGINIE, a great French actress, born at Paris, 1797. On the stage before she was five years old, she played children's and boys' rôles with marvellous precocity of intelligence and grace, but first awoke to a sense of her real greatness in an engagement at Lyons, where her playing of *soubrette* rôles endeared her to the citizens. In 1821 she began to play at the Gymnase, but her greatest triumphs were won at the Théâtre du Palais-Royal, whither she betook herself in 1834. From 1844 to 1859 she played at the Variétés, in the provinces, and at London, when she undertook the management of the Folies-Dramatiques. She died, December 1, 1875. See *Life* by Duval (1876).

DE JURE. See DE FACTO.

DE KALB, a co. in n.e. Alabama, on the Georgia border, intersected by the Alabama, Great Southern and the Queen and Crescent route railroads; 760 sq. m.; pop. '90, 21,106, includes colored. The productions are wheat, corn, etc. There is good water-power and much fine scenery. Co. seat, Fort Payne.

DE KALB, a co. in n.w. Georgia, on the Chattahoochee, traversed by the Southern and the Georgia railroads; 260 sq. m.; pop. '90, 17,189, includ. colored. Surface elevated and uneven, with very rich soil in the valley of the river. Productions, wheat, corn, cotton, etc. Iron and granite are abundant, and there are chalybeate springs. Stone mountain, in the e. part of the co., is one of the curiosities of the state. Co. seat, Decatur.

DE KALB, a co. in n. Illinois, crossed by the Chicago and Northwestern, and other railroads; 650 sq. m.; pop. '90, 27,066. It has a rolling surface and fertile soil, mostly of prairie, producing wheat, corn, oats, barley, flax, wool, butter, cheese, etc. Co. seat, Sycamore.

DE KALB, a co. in n.e. Indiana, on the Ohio border, drained by the St. Joseph's and smaller rivers, and intersected by several railroads; 370 sq. m.; pop. '90, 24,307; in '80, 20,225. The surface is undulating and the soil fertile. Agriculture is the main business. Co. seat, Auburn.

DE KALB, a co. in n. w. Missouri, drained by tributaries of the Platte, reached by the Chicago, Rock Island, and Pacific railroad; 440 sq. m.; pop. '90, 14,539, includ. colored. The surface is level and the soil fertile; productions, agricultural. Co. seat, Maysville.

DE KALB, a co. in n. Tennessee; 310 sq. m.; pop. '90, 15,650, includ. colored. The surface is diversified and the soil fruitful; productions, agricultural. Co. seat, Smithville.

DE KALB, JOHN, Baron, 1721–80; b. in Bavaria, and a general in the American army of the revolution. He was sent, in 1762, by France to the American colonies as her unavowed agent. He was in the French army when he engaged to serve in the cause of the Americans. The next year he accompanied Lafayette to America, was by congress made maj.-gen., and was in the army under Washington. He served in New Jersey and Maryland; was second in command under Gates; led the Maryland and Delaware troops in the battle of Camden, where he received eleven wounds, and died three days afterwards. A bronze statue of him was dedicated at Annapolis, Md., in 1886.

DEKKER, THOMAS, a dramatist of some note, was b. in the latter part of the 16th century. He appears to have applied himself industriously to his vocation, and is said to have written upwards of 20 plays, either wholly or in part. In company with Ben Jonson, he wrote for the Lord Admiral's theater; the two dramatists, however, afterwards quarreled. D.'s chief plays are *Fortunatus, or the Wishing-cap,* and *The Honest Whore.* Hazlitt, who regarded the latter as a highly successful comedy, has said that it unites "the simplicity of prose with the graces of poetry." D. died about the year 1638. His poetic diction is choice and elegant, but he often wanders into absurdity. His life, like that of many of his contemporaries, seems to have been one of alternate revelry, want, and despair. Recently, D. has become better known by the re-issue of a work of his (not a play), called the *Gull's Hornbook,* which is full of interesting details

DE KOVEN, JAMES, D.D., 1831–79; b. Conn. an Episcopal clergyman and writer, graduated at Columbia college, and at the general theological seminary of New York in 1854. He was rector in Wisconsin for five years. In 1875, he was elected bishop of Illinois, but in consequence of his extreme high-church views he was not consecrated. In 1878, he was chosen assistant-rector of Trinity church, New York, but declined to leave his work as dean of Racine (Wis.) college. He declined a call to Philadelphia also for the same reason.

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DE KOVEN, REGINALD, MUS. DOC., b. 1859 in Conn., an American musician, noted for his songs and the operas *Don Quixote* (1890), *Robin Hood* (1891), *The Fencing Master* (1892), and *The Knickerbockers* (1892).

DEL, *Artocarpus pubescens*, a tree of the same genus with the bread-fruit (q.v.), indigenous to the forests of Ceylon, and valuable on account of its timber, which is used both for house-carpentry and for ship-building.

DE LA BECHE, Sir HENRY THOMAS, a well-known geologist, was b. near London in 1796. He was educated at the military school at Great Marlow, and entered the army in 1814. Three years after, he became a fellow of the geological society, of which he was afterwards made secretary, and eventually president in 1847. In 1820, while residing in Switzerland, he published a paper, *On the Temperature and Depth of the Lake of Geneva*. Shortly after, he returned to England; and in 1823, in conjunction with the Rev. Mr. Conybeare, he issued a paper, *On the Discovery of a New Fossil Animal, forming a Link between the Ichthyosaurus and the Crocodile*. This was the plesiosaurus. In 1824, De la B. visited Jamaica, where he possessed some property, and while there he devoted himself to the geology of the country, and in two years published a paper on that subject. On his return to England, he wrote a variety of scientific papers, among which are the following: *On the Excavation of Valleys, On the Geographical Distribution of Organic Remains*, and his *Geological Manual* (1831), which met with a very cordial reception. He now undertook to form a geological map of England, in which the various formations should be distinctly marked. Shortly after he had begun, the government, sympathizing with his design, instituted the geological survey, and placed him at its head. In 1848, De la B. received the honor of knighthood; in 1851, he published the *Geological Observer*, with upwards of 300 wood-cuts; and in 1853, was elected a corresponding member of the academy of sciences of Paris. He continued to discharge the duties of his position until within two days of his death, in 1855.

DELACROIX, FERDINAND VICTOR EUGENE, a modern French painter, chief of the "romantic school," was b. at Charenton-Saint-Maurice, near Paris, 26th April, 1799. At the age of 18, he entered the *atelier* of the artist Pierre Guérin. In 1822, he exhibited his first work, "Dante and Virgil." It attracted much attention The love of color at the expense of accurate drawing, for which D. afterwards became conspicuous, is quite visible in it. It was highly praised, however, by M. Thiers among others. In 1824, D., who was now at the head of the new school of young painters, produced the "Massacre of Scio;" in 1826, the "Death of Marino Faliero," and "Greece on the Ruins of Missolonghi;" in 1827, "Christ in the Garden of Gethsemane," "Appearance of Mephistopheles to Faust," "The Blind Milton Dictating Paradise Lost," and the "Death of Sardanapalus;" and in 1828, "Cardinal Richelieu." The July revolution left its impress on D., and in 1831, appeared his "Liberty Directing the People on the Barricades." About this time, he made a voyage to Morocco, where he familiarized himself with novel effects of light and costumes. The Paris exhibition of 1852 contained the results of his artistic expedition. From this period, D. continued to send forth picture after picture, which proved at least the extraordinary fecundity of his mind. The principal are the "Prisoner of Chillon" (1835); "Cleopatra" (1838); "Hamlet Contemplating the Skull of Yorick" (1838); "Capture of Constantinople by the Crusaders" (1841); a "Shipwreck" (1841); "Death of Marcus Aurelius" (1845); "Farewell of Romeo and Juliet" (1846); and "Flowers and Fruits" (1849). Delacroix also decorated many public buildings and churches. In 1857 he was chosen by the institute to fill the place of Paul Delaroche (q.v.).—The most striking quality of D.'s genius is his wonderful versatility. He has painted almost all sorts of subjects, involving a vast variety of costumes. As a colorist, he ranks high, but he is almost equally noted, as has been said, for his incorrect drawing. What renders his pictures so attractive, is a certain dramatic energy of execution, with brilliant effects of light and shadow. He has been compared to Paolo Veronese and Rubens, but is vastly inferior to both. He has also been styled the *Victor Hugo* of painting, a criticism which more nearly expresses the truth. He died Aug. 13, 1863.

DELAFIELD, RICHARD, 1798–1873; b. N. Y., graduate of West Point. In 1864, he was chief of engineers, with the rank of brig.gen. He was employed on the northern boundary surveys, in building fortifications, and river and harbor improvements, and in making roads and canals. He was president of the military commission to the Crimea in 1854–56. When the civil war began, he was on the staff of the governor of New York, and afterwards had charge of the engineering bureau of the war department; retiring, 1866, with the rank of brevet maj.gen. He was a regent of the Smithsonian institution.

DELAGO'A BAY, an inlet on the s.e. coast of Africa, lat. 25° 58′ s., and long. 33° east. It is about 55 m. in length, and about 20 in breadth. Into D. B. many rivers fall, among which are the Delagoa river, from the w., which gives its names to the bay; the Manice, from the n.; and the Machavanna, from the south. Delagoa Bay is important, as being the key to the free Dutch States of South Africa. A railway connecting D. B. with the interior was built by a British company, but was seized by the Portuguese in 1889. Claims for compensation gave rise to long protracted negotiations. In 1895 the line was opened to Pretoria. In 1896 the length of the railway was 382 m. See TRANSVAAL.

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DE LA MATYR, GILBERT, b. Pharsalia, N. Y., 1825. He studied theology and graduated in the theological course of the M. E. Church, 1854. He became an itinerant elder, and was a member of the general conference, 1868. During the civil war he was chaplain of a N. Y. regiment, He settled in Indianapolis, Ind., and was elected to congress as a "greenbacker" in 1878. He d. in 1892.

DELAMBRE, JEAN BAPTISTE JOSEPH, a French astronomer, was b. at Amiens, 19th Sept., 1749, and studied first under Delisle, and afterwards under Lalande, with both of whom he formed a close friendship. The discovery of the planet Uranus, in 1781, gave him the first opportunity of attracting the attention of the learned world in general. He formed tables of its motion, which obtained the annual prize of the academy of sciences. Soon after, he commenced the construction of new solar tables, and, at a still later period, tables of the motions of Jupiter and Saturn. Along with Méchain, he was appointed by the French government, in 1792, to measure the arc of the meridian between Dunkirk and Barcelona, which was completed in 1799. Afterwards, he was elected member of the academy. In 1802, he was appointed inspector-general of education, and in 1803, perpetual secretary of the mathematical section of the institute. The result of his measurements appeared in his great work, *Base du Système Métrique Décimal* (1806–10). In 1807, he obtained the chair at the college of France, rendered vacant by the death of Lalande, his master and friend. In 1814, he was appointed a member of the council of public instruction. He died at Paris, 19th Aug., 1822. D. received a multitude of honors during his lifetime. He was a member of most of the learned bodies in Europe, an officer of the legion of honor, and a chevalier of the order of St. Michael. His writings are very numerous. The principal are: *Traité d'Astronomie* (Paris, 1814); *Histoire de l'Astronomie du Moyen Age* (Paris, 1819); *Histoire de l'Astronomie Moderne* (1821); and *Histoire de l'Astronomie au Dix-huitième Siècle* (Paris, 1828–27), published under the care of Matthieu. Besides these, D. wrote several excellent *Mémoires*.

DE LANCEY, JAMES, 1703–60; b. N. Y.; son of a French Huguenot; graduated at Cambridge, England. He was for many years chief-justice of the supreme court of New York, and for several years lieutenant-governor of the colony. He was one of the founders of Columbia college.

DE LANCEY, WILLIAM HEATHCOTE, D.D., LL.D., D.C.L., 1797–1865; b. N. Y., graduate of Yale; student of theology under bishop Hobart. He was assistant to bishop White, of Philadelphia, and secretary to the house of bishops in the general convention of the Episcopal church in the United States. In 1828, he was provost of the university of Pennsylvania, and in 1833 assistant minister in a church in Philadelphia. In 1838, he was chosen bishop of the western diocese of New York. In 1852, he was a delegate from the Episcopal bishops of the United States to England, and was honored with the degree of D.C.L. from Oxford university.

DELAND, MARGARETTA WADE (CAMPBELL), American author, was born in Pittsburg, Pa., in 1857, and in 1880 was married to Louis F. Deland, of Boston. She began her literary work in 1884, and published *Poems* (1886), *The Old Garden*, another volume of verse (1886); and the novels, *John Ward, Preacher* (1888), *Sidney* (1890), and *Philip and his Wife* (1895).

DELANE, JOHN THADDEUS, late editor of the London *Times*, was b. in London in 1817. He received the earlier part of his education in a private seminary, first in England, and afterwards in France. He then went to Oxford, where he entered himself of Magdalen hall. His father being manager of the *Times*, he was at a very early age introduced into the editor's room, and on the death of Mr. Barnes in 1841, succeeded to the direction. Under his editorship, the *Times* attained a prodigious circulation, and an influence unparalleled in the history of journalism. The division of labor in newspapers being more complete than in the days of his predecessors, the duty of the modern editor is not so much to write in his own journal, as to suggest topics to others; to revise and bring into harmony conflicting contributions. These are duties requiring for their due fulfillment great tact, quickness of decision, a ready discrimination of those straws on the surface which denote the ultimate direction of public feeling—qualifications which D. obviously possessed in very large measure. He resigned the editorship in 1877. D. was a member of the hon. society of the Middle Temple, having been called to the bar in 1847. He d. 1879.

DELANO, BENJAMIN FRANKLIN, 1809–82; b. South Scituate, Mass. He was appointed naval constructor in the Brooklyn navy yard, 1851, and served there continuously until 1873, when he was retired. Among the many ships of war which he modeled were the *Minnesota*, the *Roanoke*, and the *Iroquois*.

DELANO, COLUMBUS, born in Vermont in 1809; was educated at the common schools, and admitted to the bar in 1831. Held various public offices from delegate to republican convention in 1860 to commissioner of internal revenue in 1869, in which office his services were very valuable. He was secretary of the interior, 1870–75. Has been trustee of Kenyon College, Ohio, and has endowed there a grammar school called Delano Hall.

DE LA RIVE, AUGUSTE, 1801–73; a Swiss physicist who devoted much attention to researches in electricity. At the age of 22 he was appointed to the chair of natural

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philosophy in the Geneva academy. He made original discoveries in connection with magnetism, electric dynamics, the connection of magnetism with electricity, the properties of the voltaic arc, and the passage of electricity through extremely rarefied media. He published a complete treatise on electricity, which is accepted as a standard work. In 1864, he received the highest honor open to the scientific men of Europe in his nomination as one of the eight foreign associates of the French academy.

DELAROCHE, PAUL, a historical painter, the head of the modern "eclectic" school of art in France, was b. in Paris in 1797, became a pupil of baron Gros, and between the years 1819 and 1823, acquired some note by painting subjects taken from Scripture, but first excited public admiration in 1824, by his "St. Vincent de Paul preaching in the Presence of Louis XIII.," and "Jeanne d'Arc interrogated in Prison by Cardinal Beaufort." These exhibit the earliest indications of that style for which he afterwards became famous —a style which endeavored to unite the picturesqueness of the romantic with the dignity of the classic school of art. In 1826, D. produced his "Death of President Durante;" and in 1827, his "Death of Queen Elizabeth." These pictures greatly increased his reputation, but the last is reckoned a failure by English critics. In 1831, appeared his "Children of Edward IV. in the Tower," a work of very high merit, but transcended, in this respect, by his "Cromwell contemplating the Corpse of Charles I." (1833), which is generally regarded as one of the first historical paintings of modern times. Both are well known in Britain through the medium of engravings. In 1834, appeared his "Execution of Lady Jane Grey;" and in 1837, his "Charles I. in the Guard-room Insulted by the Parliamentary Soldiers," and his "Lord Strafford on the Way to Execution receiving the Blessing of Archbishop Laud." From this period until 1841, he was engaged on what is probably his grandest work—the series of paintings executed on the wall of the semicircular saloon of the ecole des beaux arts. This composition contains 74 figures, comprising the greatest sculptors, painters, and architects in all history, according to D.'s judgment. The style is simple, lofty, and chaste. Among his later works may be mentioned, "Bonaparte at St. Bernard" (1850), "Marie Antoinette before the Revolutionary Tribunal" (1851), "Moses Exposed" (1852), "Calvary" (1853), "Jesus in the Garden of Gethsemane" (1854), "The Girondins in the Concierge" (1856). He died Nov. 4, 1856.—The characteristic excellences of D. are delicacy of treatment, picturesqueness of conception, harmony of color, and accuracy of drawing. He has been accused, however, of want of fire, imagination, and depth, and it must be admitted that he very rarely, if ever, exhibits the highest qualities of creative genius. D. was named a member of the institute in 1832, and professor of painting in the ecole des beaux arts in 1833.

DE LA RUE, WARREN, an English astronomer and inventor, born 1815 on the island of Guernsey. He invented improvements in oil refining, color printing and envelope folding machines, but is known chiefly for having made photographs of the heavenly bodies. He d. 1889.

DELAUNAY, CHARLES EUGÈNE, 1816–72; a French astronomer, educated at the polytechnic school, the first one to whom the Laplace prize was awarded. He became a professor of mechanics, and in 1855, a member of the academy. He was chosen a member of the royal astronomical society of London in 1869. The next year he was the successor of Leverrier in the Paris observatory, and a year later received the professorship of astronomy and geology in the polytechnic school. He published a number of valuable treatises.

DELAUNAY, LOUIS ARSÈNE, was born in Paris, March 21, 1826. He made his first appearance as an actor at the Odeon, October, 1846. In 1848, he appeared as Durante at the Théâtre Français, and soon after became secretary of that theatre. He is one of the most accomplished of the French actors, finding his parts in the plays of Augier, De Musset, Hugo, and Pailleron.

DELAVIGNE, JEAN FRANÇOIS CASIMIR, a French poet and dramatic writer, was b. at Havre, 4th April, 1793, and educated at the lycée Napoléon in Paris, where he first attracted notice by his poem on the birth of the "king of Rome" in 1811. A few years after the fall of Napoleon, he published his *Messéniennes*, a series of patriotic elegies, in which he bitterly deplored the misfortunes brought upon his country by the disaster of Waterloo. The July revolution inspired his song *La Parisienne*, which was set to music by Auber, and he wrote several other revolutionary lyrics, such as *La Varsovienne ou la Polonaise*, and *La Bruxelloise*. Many offers of employment in political affairs were made to him by Louis Philippe, but he chose to remain a *littérateur*, and worked assiduously at the composition of plays. His incessant labors at length undermined his health, and he returned to Lyons for change of air, where he died 10th Dec., 1843. D. is, next to Béranger and Scribe, the most popular of recent French poets. He represents that "golden mean" of the French Parnassus, the half-classic, half-romantic style of poetry. There is nothing extravagant, nothing profound about him. Easily comprehended, moderately liberal, with a slight tincture of skepticism and Voltairian wit, yet, on the whole, rather moral in his tendencies, D. was just the man to charm the more elegant and decorous circles of Parisian society. His language, too, is piquant, picturesque, and select, and skillfully conceals the lack of poetic substance. The titles of his principal dramatic pieces are *Les Vêpres Siciliennes* (1819), *Les Comédiens* (1820), *Marino Faliéri* (1829), *Louis XI.* (1832), *Les Enfants d'Edouard* (1833), *Don Juan d'Autriche*

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(1835) and *La Fille du Cid* (1839). The first edition of D.'s works (1845) contains a biography by his brother Germain, and a panegyric by Sainte-Beuve.

DELAWARE, a middle Atlantic state, and one of the original 13; between lat. 38° 28′ and 39° 50′ n.; long. 75° and 75° 46′ w.; bounded on the n. and n.w. by Pennsylvania; on the e. by D. river and bay and the Atlantic Ocean; on the s. and w. by Maryland; length, 96 m.; width from 9 to 36 m.; area, 2050 sq.m., 90 of which are water, or 1,312,000 acres. Excepting Rhode Island, it is the smallest of the states.

HISTORY.—Delaware, popularly called the "Diamond State," was named after Lord De la Warr, or De la Ware, an early colonial governor of Virginia, who sailed up the bay in 1610, though Henry Hudson had preceded him by nearly a year. The aboriginal inhabitants were the Minquas in the n. and the Nanticokes in the s. In 1631–32 the Dutch planted a small colony near Cape Henlopen, but the Indians drove them out three years later. In 1638 there came a colony of Swedes and Finlanders, who bought land and built a fort on Christiana Creek, named the country New Sweden, and a little later put up a fort on the island of Tinnicum, only a few miles below Philadelphia. This was considered by the Dutch of New Amsterdam an invasion of their territory, and they set up Fort Casimir, near the site of the present New Castle, only 5 m. from the Swedish fort. A settlement on the D., made in 1641 by a colony from New Haven, Conn., was broken up by them, causing great financial disaster. The Swedes took Fort Casimir in 1654, but the next year the Dutch seized the whole country, and sent to England all the colonists who refused allegiance to Holland. When New York came under the English government, in 1664, the D. settlements were claimed for the Duke of York, and also, by Lord Baltimore, for Maryland. But William Penn, soon after he settled Pennsylvania, purchased the duke's right, and effected a compromise with Baltimore, so as to add the D. settlements to Pennsylvania; and for 20 years they were governed as a part of that state, under the name of the "territories, or three lower counties on the D.," each co. sending six representatives to the general assembly. In 1703, D. set up for herself so far as to establish a separate legislature, but the rule of the Pennsylvania governor was conceded on the ground of proprietary rights, until the period of the revolution, when the state became independent. While the other colonies suffered severely by Indian forays and wars, D. was almost exempt, being in a corner by the sea, out of the path of such trouble. Her men were found, however, on the side of England in the French war; and in the revolution, the soldiers of this little colony were foremost in good service, and the "Blue Hen's chickens," as the Delaware volunteers were called, were among the best and bravest of Washington's troops.

The number of troops enlisted was 3763. The state was the first (Dec. 7, 1787) to ratify the federal constitution. In 1861, although a slave-holding state, D. refused to secede. Many of her people were in strong sympathy with the confederate cause, and some—how large a number is unknown—joined the confederate army. To the union army 13,670 troops were furnished, of whom 954 were colored. In 1791 a second constitution was adopted, which was amended in 1831.

TOPOGRAPHY.—There are no mountains, the highest elevation being only 282 ft. above the sea; but in the extreme n. it is hilly, and from Christiana River a low, wooded ridge extends southward near the w. boundary; elsewhere the surface is uniformly level, and generally sandy. The streams flowing from this water-shed empty either into the D. or into Chesapeake Bay. The principal streams are Christiana and Brandywine Rivers. The first named, flowing in from Pennsylvania, is the only one navigable for large vessels, and then only to Wilmington. The coast of Delaware Bay is marshy; the Atlantic coast has many sand beaches, enclosing shallow lagoons. The only harbors are Wilmington, Lewes, and New Castle. Rehoboth Bay, at the mouth of Indian River, is of large extent, and admits vessels drawing 6 ft. of water. Cypress Swamp, on the southern border, is 12 m. long and 6 m. wide. There are chalybeate springs in the northern part of the state.

GEOLOGY AND MINERALOGY.—The northern part of New Castle co. belongs to the cretaceous period; the tertiary succeeds this, extending through the greater part of Kent co., and the remainder of the state is assigned to the post-tertiary or alluvial period. There are several iron mines and large deposits of kaolin in New Castle co.; bog-iron ore is found in the swamps; and shell marl and glass sand are abundant.

ZOOLOGY AND BOTANY.—The wild animals, with the exception of the smallest species, such as the squirrel, woodchuck, etc., are almost extinct. Wild geese, ducks, and water-fowl of many kinds abound along the shore of Delaware Bay, especially in the marshes. Cypress Swamp is infested with a number of poisonous reptiles. Among plants and trees are the globe flower, magnolia, St. John's-wort, dwarf thorn, dogwood, redbud, sweet gum, loblolly pine, holly, bald cypress, and cedar.

CLIMATE, SOIL, AND AGRICULTURE.—The climate is very equable and healthful in the northern and central parts of the state, but in the southern and swampy portions fevers are not uncommon. The yearly mean temperature at D. City is 54.69°. The soil along D. river and bay is a clayey loam of great fertility; elsewhere it is light, warm, and sandy, but productive when well fertilized. The staple products are corn, wheat, oats, and peaches, apples, berries, and small fruits raised for the Philadelphia and New York markets. The number of farms by the census of 1890 was 9,381; average size, 113 acres; the value of the farms was in round numbers $39,500,000; of farm

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AREA AND POPULATION OF MARYLAND AND DELAWARE BY COUNTIES.

(ELEVENTH CENSUS: 1890.)

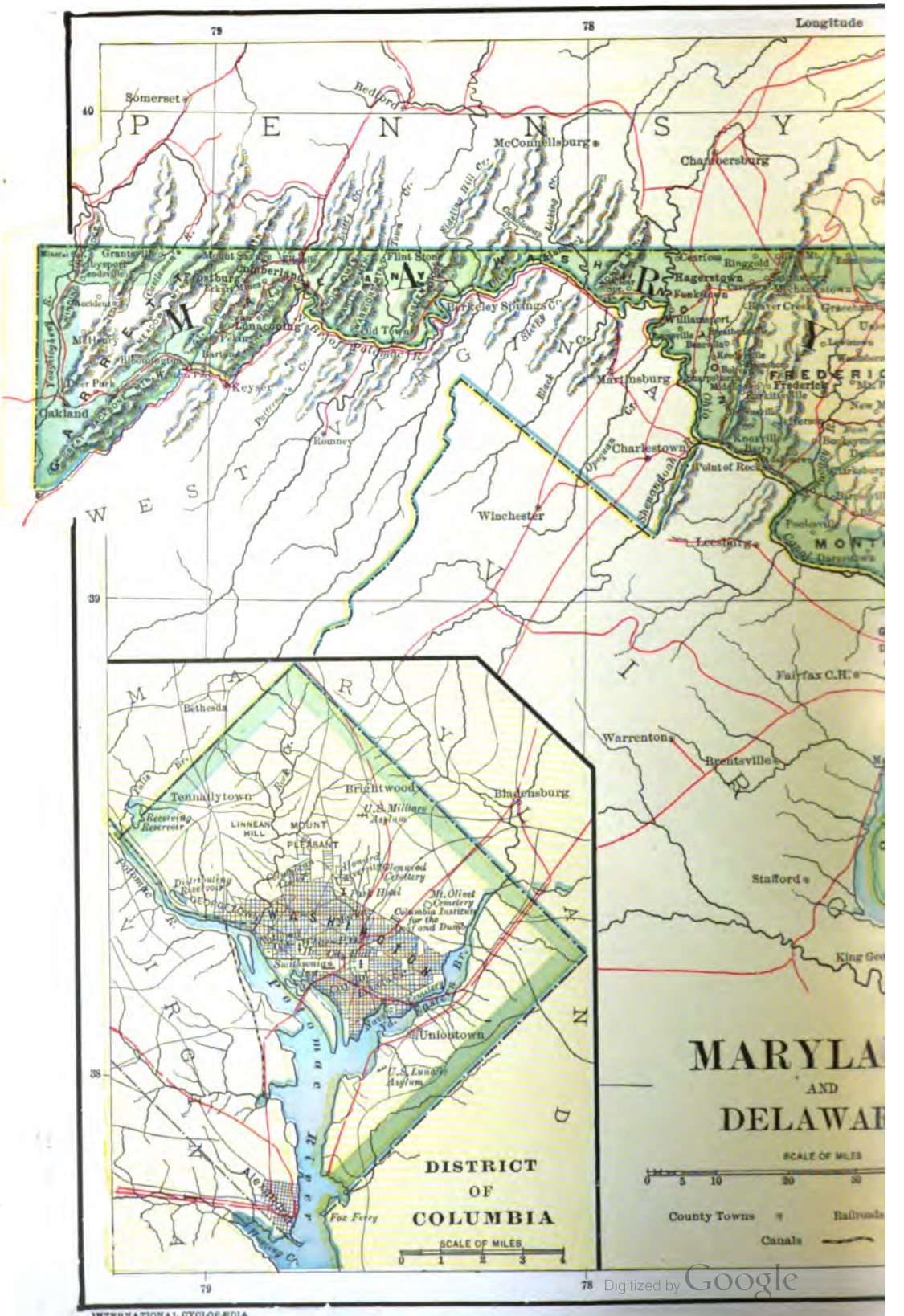
MARYLAND.

	Area in Square Miles.	Population.		Area in Square Miles.	Population.
Allegany	477	41,571	Howard	250	16,269
Anne Arundel	400	34,094	Kent	315	17,471
Baltimore	622	72,909	Montgomery	508	27,185
Baltimore City	28	434,439	Prince George's	480	26,080
Calvert	218	9,860	Queen Anne	352	18,461
Caroline	315	18,903	St. Mary's	360	15,819
Carroll	426	32,376	Somerset	365	24,155
Cecil	375	25,851	Talbot	285	19,736
Charles	460	15,191	Washington	435	39,782
Dorchester	610	24,843	Wicomico	369	19,930
Frederick	633	49,512	Worcester	475	19,747
Garrett	680	14,213			
Harford	422	28,993	Total	9,860	1,042,390

DELAWARE.

	Area in Square Miles.	Population.		Area in Square Miles.	Population.
Kent	630	32,664	Sussex	900	38,647
New Castle	430	97,182			
			Total	1,960	168,493

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Longitude
79
78
40
39
38
Somerset
Bedford
McConnellsburg
Chambersburg
PENNSYLVANIA
WEST VIRGINIA
VIRGINIA
MARYLAND
Hagerstown
Williamsport
Martinsburg
Charlestown
Winchester
Berkeley Springs
Cumberland
Frostburg
Lonaconing
Oakland
Deer Park
Keyser
Mt Henry
Grantsville
Accident
Romney
Point of Rocks
Leesburg
Fairfax C.H.
Warrenton
Brentsville
Stafford
Bethesda
Tennallytown
Brightwoods
Bladensburg
U.S. Military Asylum
Receiving Reservoir
LINNEAN HILL
MOUNT PLEASANT
Glenwood Cemetery
Mt. Olivet Cemetery
Columbia Institute for the Deaf and Dumb
Soldiers' Home
Anacostia
Unionstown
U.S. Lunatic Asylum
Alexandria
Fox Ferry
DISTRICT OF COLUMBIA
SCALE OF MILES
0 1 2 3 4
SCALE OF MILES
0 5 10 20 30
County Towns
Railroads
Canals
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products sold or on hand, $7,000,000. The peach crop varies from 3,000,000 to 4,000,000 baskets or crates yearly; the strawberry crop, 7,000,000 quarts; the cranberry crop, 300,000 bushels. Grapes, melons, corn, and amber wheat, with oats, sorghum, berries, and dairy products, complete the list of Delaware's chief agricultural staples. In Kent, great quantities of tomatoes are grown for canning. In this county lie some 180,000 acres of rich alluvial land. To a distance of ten miles from the bay, the soil is very fertile, and the well-kept estates, with their vineyards and orchards, present a charming picture of affluent peace. Delmar, Laurel, Georgetown, Smyrna, Harrington, and Bridgeville are the chief centers of shipping for peaches, to the production of which not less than 55,000 acres are devoted.

MANUFACTURES, ETC.—The manufactures include rolled iron, steel, cotton and woolen goods, flour and meal, morocco leather, patent leather, powder, cars, carriages, etc., paper, brick and tile, chemicals, glass, canned goods, machinery, and iron and wooden ships. The principal manufactures are at Wilmington. The fisheries employed in 1890 some 2000 persons. There are more than 3000 acres of oyster beds, with an annual produce value of nearly $1,000,000. Clays and kaolins abound, and are worked up at Wilmington into terra-cotta, bricks, and crockery. In this industry, more than 700 men are continually employed. Near Wilmington is quarried the fine spar employed in the manufacture of artificial teeth. The iron and steel works of that city employ 6000 men and have an output worth $11,000,000 annually. Other industries established here are manufactures of cotton goods, pulp, paper, and leather goods. The great Edge Moor Bridge Works are also near Wilmington on the Delaware River. At Dover, fruit-canning is an important industry. The total value of the manufactures of Delaware in 1890 was $37,571,848.

COMMERCE.—There is some foreign commerce direct through Wilmington, but such trade is generally through Baltimore or some northern port. The coasting trade is important, especially with New York, with which Wilmington is connected by a line of steamers. Wilmington is a customs district, and there are deputy collectors at New Castle and Lewes.

TRANSPORTATION.—The principal railroads with lines extending through the State are the Baltimore and Ohio, Philadelphia, Wilmington and Baltimore, and New York, Philadelphia and Norfolk. The total mileage in 1895 was 421; capital stock, $8,214,000: funded debt, $6,375,000; total investment, $15,183,416; cost, $14,944,839; gross earnings, $3,423,479. Chesapeake and Delaware Bays are connected by a canal 13½ miles long, 66 feet wide, and 10 feet deep. This work was completed in 1829 at a cost of $2,250,000: 4 miles being cut through a hill 90 feet high. The massive breakwater at Lewes was begun in 1828, and completed in 1869, at a cost of over $2,000,000.

BANKS.—On Oct. 31, 1896, there were 18 national banks in operation, with combined capital $2,133,985, and deposits $4,774,248; 2 State banks, with capital $344,000 and deposits $758,489; a loan and trust company, capital $500,000, deposits $1,068,971; and 2 mutual savings banks with deposits $800,594 and resources $932,518.

RELIGION, EDUCATION, ETC.—The leading religious denominations are the Methodist Episcopal, Presbyterian, Protestant Episcopal, Baptist and Roman Catholic. Wilmington is the see city of the Protestant Episcopal diocese of Delaware and of the Roman Catholic diocese of Wilmington. There are over 400 churches. The public school system was established in 1875. In 1896 the number of pupils enrolled was 31,181; number of districts, 340; number of schools, 715; value of school property, $1,080,148; total receipts (1896), $347,900; salaries of teachers, $238,259; total expenditures, $351,975. The State board of education consists of the superintendents of the three counties under the general authority of the governor. The State school fund is largely derived from Delaware's share in the United States surplus revenue and from the proceeds of certain fees and licenses. In 1895 there were 4,858 scholars enrolled in the schools for the colored race; and the number of teachers (colored) was 106. There is an Agricultural college for colored students at Dover. The State has no normal schools, but teachers' institutes are held in each county. The only institution for higher instruction is Delaware College at Newark, which is open to both sexes, and in 1895 contained 78 students and a faculty of 12 There are 5 academies and secondary schools. In 1893 there were 12 public libraries containing 62,643 vols., and in 1896 there were published 38 newspapers and periodicals, including 5 daily, 28 weekly, and 4 monthly.

GOVERNMENT, ETC.—Dover is the capital of the state. The franchise is given to actual county taxpayers, who have resided one year in the state and one month in the county. Elections and legislative sessions are held biennially—the former on the Tuesday after the first Monday in Nov. There is a senate of nine members, three from each county, chosen for four years, and a house of representatives of 21, seven from each county, chosen for two years. Senators must be 27 years of age or over, and be freeholders in their own counties; representatives must be 24 or over, and both must have been citizens of the state one year and of the county one month to be eligible to seats in the legislature. Their pay is $3 per day and mileage. The governor must be 30 years old, 6 years a resident, and 12 years a citizen of the United States; he is not eligible for immediate re-election; salary, $2000 per year. There are five judges, one of whom is chancellor, and one the chief justice; salary of each, $3000. Ministers of the gospel are not permitted to hold any civil office. The real property, stocks, plate, etc., owned by a woman at her marriage are not subject to the husband's control

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or liable for his debts, but a wife cannot make a conveyance without the husband's consent. Treason, murder in the first degree, arson of a dwelling, rape and burglary at night, with intent to commit high crimes, are punishable with death. The whipping-post and pillory have been in use for petty offenders. Adultery by a wife or impotence on either side are causes for divorce; and divorce may be granted for cruelty, abandonment, etc.

Until 1828 the presidential electors of D. were chosen by the legislature; since then they have been elected by the popular vote. In 1812, 1816, and 1820 D. had 2 representatives in congress, and therefore cast 4 electoral votes; but at all other times, having but one such representative, she has cast only 3 electoral votes. The votes of the state for president, and vice-president at the several elections have been as follows 1789, Washington and Jay; 1792, Washington and John Adams; 1796, John Adams and Thomas Pinckney; 1800, John Adams and Charles C. Pinckney; 1804, Charles C. Pinckney and Rufus King; 1808, Charles C. Pinckney and Rufus King; 1812, De Witt Clinton and Jared Ingersoll; 1816, Rufus King and Robert G. Harper (one vacancy); in 1820, Monroe and Daniel Rodney; 1824, for president, William H. Crawford, 2, John Q. Adams, 1; vice-president, Clay 2, Calhoun 1; in 1828, John Q. Adams and Richard Rush; 1832, Clay and John Sergeant; 1836, Harrison and Francis Granger; 1840, Harrison and Tyler; 1844, Clay and Frelinghuysen; 1848, Taylor and Fillmore; 1852, Pierce and William R. King; 1856, Buchanan and John C. Breckenridge; 1860, John C. Breckenridge and Joseph Lane; 1864, no vote; 1868, Horatio Seymour and Francis P. Blair; 1872, Grant and Wilson; 1876, Tilden and Hendricks; 1880, Hancock and English; 1884, Cleveland and Hendricks; 1888, Cleveland and Thurman; 1892, Cleveland and Stevenson; 1896, McKinley and Hobart.

FINANCES.—Total receipts in 1896, including balance on hand from 1895, $206,978.17; disbursements, $191,726.25; liabilities, $719,750; assets, $1,091,905; excess of assets, $372,155; receipts of school fund, $173,247; disbursements, $137,793; appropriation for colored schools, $15,000. Criminals are confined in the county jails, as there are no State penal institutions. The total available force for military duty in 1897 was over 28,000.

POPULATION.—In 1790, 59,094—3899 free colored, 8887 slave; 1800, 64,723—8268 free colored, 6153 slave; 1820, 72,749—12,958 free colored, 4509 slave; 1840, 78,085—16,919 free colored, 2605 slave; 1860, 112,216—19,829 free colored, 1798 slave; 1870, 125,015—22,794 colored; 1880, 146,608—26,448 colored, including 5 Indians; foreign born, 9468, of whom 5791 were Irish; male, 74,108; female, 72,500; dwellings, 27,215; families, 28,253; population in 1890, 168,493. The state is divided into three cos.—Kent, New Castle, and Sussex—each having the same numerical representation in the legislature. This may have been equitable at first, but it is so no longer; since the co. of New Castle, at the northern end of the state, of which Wilmington is the capital, contains a larger population than both the other cos. put together.

Population of Kent co. 1890, 32,664; New Castle, 97,182; Sussex, 38,647. The townships bear the name of "hundreds," as anciently in England. The pop. of Wilmington, in 1890, was 61,431; of Dover, 3061. New Castle and Smyrna, the next places in size, numbered, 1890, 4010, and 2455, respectively.

See Vincent's *History of Delaware* (vol. 1, Phila., 1870); Ferris's *A History of the Original Settlements on the Delaware* (Wilmington, 1846).

DELAWARE, a co. in e. Indiana, on White river, crossed by several railroads; 400 sq. m.; pop. '90, 30,131. The surface is level and the soil fertile. Much of the co. is still covered with forests. Productions, agricultural. Co. seat, Muncie.

DELAWARE, a co. in e. Iowa, on the Illinois Central railroad; 576 sq. m.; pop. '90, 17,349. The surface is hilly and well supplied with water, although there is no large stream. Productions, wheat, corn, oats, barley, cheese, butter, etc. Co. seat, Manchester.

DELAWARE, a co. in s.e. New York bounded n.w. by the Susquehanna, intersected by the Delaware river, and reached by the New York, Ontario, and Western railroad; 1557 sq. m.; pop. '90, 45,496. The surface is hilly, but the lowlands are exceedingly fertile. Co. seat, Delhi.

DELAWARE, a co. in central Ohio, on the Scioto and Olentangy rivers, crossed by several railroads; 452 sq. m.; pop. '90, 27,189. Surface even; soil fertile. Productions, wheat, corn, oats, butter, wool, maple sugar, flax, etc. Co. seat, Delaware.

DELAWARE, a co. in s.e. Pennsylvania, on the Delaware river, below Philadelphia, crossed by several railroads; 200 sq. m.; pop. '90, 74,683. Its productions are mainly vegetables, fruits, milk, butter, etc., for the Philadelphia market. Water-power is abundant. In this section the original Swedish settlements were made. Co. seat, Media.

DELAWARE, city and co. seat of Delaware co., Ohio, on the Elentangy river, and the Cleveland, Cincinnati, Chicago, and St. Louis, the Columbus, Sandusky, and Hocking, and the Columbus, Hocking Valley and Toledo railroads; 24 miles n. of Columbus. It is pleasantly situated on hilly ground, is a place of considerable trade and has manufactures of iron, flour, woolen, lumber, furniture, agricultural implements, etc. There are

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large railroad repair shops, several hotels, an opera house, national banks, daily and weekly newspapers, and a mineral spring of some note. Ohio Wesleyan university, organized 1842, and Ohio Wesleyan female college are situated here. Pop. '90, 8224.

DELAWARE BAY, the estuary of D. river, measures about 60 m. in length; its greatest width is 25 m., and the width at the entrance, between Cape May, in New Jersey, and cape Henlopen, in D., is 13 m. Its depth varies from 35–75 ft. A breakwater at cape Henlopen, constructed by the U. S. government, forms a large and safe harbor, from 4–6 fathoms deep.

DELAWARE RIVER rises on the w. slope of the Catskills, in two branches: the Coquago and Pepacton, which unite at Hancock, N. Y. From this point it flows s.e. to Port Jervis; then takes a general s.w. direction, passing through the Delaware water-gap (q.v.); from Easton flows s.e. to Trenton, then turns to the s.w. and enters Delaware bay, 40 m. below Philadelphia. It divides New York and New Jersey from Pennsylvania and Delaware. With a course of fully 350 m., it is navigable for large ships to Philadelphia and for steam vessels to the head of tide-water at Trenton. At Philadelphia it is nearly one mile wide. The Delaware and Hudson canal connects it with the Hudson river, and another extends from Bristol to Easton, Pa., about 60 m.

DELAWARES (see INDIANS), a tribe of the Algonquin family of American Indians, once very important, dwelling in the region of the Delaware river, in Pennsylvania and New York. They were called Lenno Lenape, from "Lenappi," a term for men in general, applied by themselves to themselves. They early became friendly and traded with the Dutch settlers of New York, and were generally on good terms with the whites. After destroying one Swedish settlement, they became friendly with that people also, and the Lutherans made some efforts to Christianize them. In 1741, the Moravians established missions near Bethlehem and Nazareth, Pa. For a long period the Iroquois held the Delawares in great contempt, stigmatizing them as women; but they fought well enough on the side of the French at Braddock's defeat and elsewhere. Long afterwards, a number of the tribes, smarting under a sense of wrong in certain treaties with the whites, took part with Pontiac in the Indian war in the north-west, and were among those who besieged Detroit in 1763. They were defeated in the same year, and their chief was killed. Not long afterwards the whites destroyed the Delaware villages on the Susquehanna. Peace was made at fort Pitt in 1765, and the tribe began at once to emigrate to the west, so that in 1768 there were none of them east of the Alleghanies. The Moravian missionaries went with their flocks, and Christian Indians rapidly increased along the Ohio; but the hostile feeling prevailed until the battle of Pleasant Point in 1774, when they were utterly scattered. In the war of the revolution most of the Delawares took the English side, although a part of the nation made a treaty with congress. The Christian Indians had settled on the Muskingum in 1772, forming three towns, one of which was of Delawares only. They took no part in the war, but attended to their farming until the English captured them, 1781, and removed them to Sandusky. A part of those returned to save their crops, but were attacked by the Americans, who murdered 90 of them. The remainder fled to Canada. These, with others, subsequently formed the town of Fairfield on the Thames; only a few members of the tribe returning to the Muskingum country. There were still many hostile, and these had a strong band of warriors in the defeat of St. Clair in 1791. Peace was made after Wayne's victory four years later, and thenceforward from time to time the tribe disposed of their lands in Ohio, and nearly all remained in Canada. In the war of 1812, they refused to join Tecumseh, and remained friendly to the United States. Even after this the Americans destroyed their town in Canada. In 1818, the Delawares, numbering about 1800, ceded all their lands to the United States, and removed to Missouri territory. By treaty in 1829, the mass of the nation, only 1000, were settled on the Kansas and Missouri. They sent 170 men to the union army, out of a total of 200 able-bodied warriors. Being disturbed by the Pacific railroad, they sold their lands and moved to a location on the Verdigris and Cane rivers. In 1866, a special treaty permitted them to become citizens of the United States, and they elected so to do, since which time they have not been regarded as a tribe. Their language was among the best known of aboriginal tongues, and a number of educational and other works have been published in it.

DELAWARE WATER-GAP, a pleasure resort on the Delaware river, in Monroe co., Penn., reached by the Delaware and Lackawanna railroad, 92 m. w. of New York. The river here makes its way through the mountains in a narrow gorge, whose rocky sides rise almost 1200 ft. above the water; and the surrounding scenery is very fine.

DE LA WARR, OR DELAWARE, THOMAS WEST, Lord, d. 1618. He succeeded his father as baron Delaware, 1602; became governor of Virginia, 1609; and landed at Jamestown the next year, after a voyage of fifteen weeks. He was an able and energetic officer, and infused new life into the colony, which had been badly managed. He founded a colony at the mouth of James river, and built two forts, which he named Henry and Charles, in honor of the king's sons. On a voyage to the West Indies for the benefit of his health, he was driven by a storm into the river which now bears his name; it was called by the natives Chickohocki. In 1611, he returned to England, but in 1618, in consequence of the tyranny of Argall, he was urgently besought to return. He complied, but died on the voyage. He published *A True Relation to the Counsell of Virginia*

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DELEB' PALM, a palm of great importance to the inhabitants of the regions around lake Tsad, and other parts of the interior and west of Africa, being in some districts the predominant tree, although very local in its distribution, which extends, however, through the vast tracts from Kordofan to the Atlantic. It is supposed to be nearly related to the palmyra palm (q.v.) of India (*borassus flabelliformis*). Its fruit, when full grown, is 6 to 8 in. long, and 4 in. thick, yellowish brown; the pulp a very close and coarse fibrous tissue. It has a mawkish taste; yet it is very much used by the natives of Africa, who also break the stone and plant it in the ground, when in a few days a blade shoots up, and a very tender root is produced, which is very pleasant, and much used as an article of food.—Barth's *Travels*.

DELECTUS PERSONÆ (Lat., choice of the person). In some legal relations, a choice of the person, for some qualification possessing value in the eyes of one of the parties to the contract, is assumed; and the individual so chosen cannot consequently transmit his rights and obligations to another without the consent of the person who is supposed to have chosen him. Thus, in Scotland, in an agricultural lease, of such duration as not to exceed the ordinary life of a man, the landlord is assumed to have chosen his tenant with a special view to his personal qualifications, and unless in virtue of a positive stipulation, the tenant cannot sublet the farm. The reverse is the case with urban tenements. For reasons still more obvious, the same rule holds in partnership; and unless in the case of great companies, where the sale of the stock is provided for, no new partner can be admitted if a single partner object to him. Even the executors and personal representatives of a partner do not succeed to his share. For the same reason, offices of trust are neither salable nor adjudgable for debt, though their emoluments may generally be attached for debt.

DELEGATE, the title given to members of the first continental congress, 1774. Representatives in the United States congress from the territories are still designated by this term. They have seats, and the right of discussion, but have no vote. The term is in common use to denote the members of partisan and religious conventions, and indeed of almost all associate bodies representing a constituency.

DELEGATES, COURT OF, formerly, the English court of appeal in ecclesiastical and maritime causes. Before the time of Henry VIII., the practice had gradually become established of taking ecclesiastical causes on appeal to the court of Rome. By 24 Hen. VIII. c. 12, this practice was abolished, and appeals were directed to be heard by the archbishops of the several provinces. By 25 Hen. VIII. c. 19, it was directed that appeals should finally be referred to the king in council, and his majesty was by the same statute empowered to issue a commission under the great seal to hear the appeals. The court thus established was called the court of delegates. It consisted, in ordinary causes, of a puisné judge from each of the common law courts, and three or more civilians. After sentence had been pronounced by the court of delegates, it was competent for the king to grant a commission of review; but this power was rarely exercised, except upon the ground of error in fact or in law. When application for review was made, it was usual to refer to the chancellor the memorial praying for review, and by him the expediency of granting the prayer of the petition was determined. By 2 and 3 Will. IV. c. 92, the court of delegates was abolished, and its jurisdiction was transferred to the king in council. And by 3 and 4 Will. IV. c. 41, and 6 and 7 Vict. c. 38, her majesty is empowered to refer all appeals from ecclesiastical or other courts to the judicial committee of the privy council.

DELEGATION (Ital. *delegazione*), the term formerly applied in Lombardy, Venice, and the states of the church, both to the governing court of a province and to the province itself. Until the recent political changes in Italy, there were nine delegations in Lombardy, and eight in Venice, each of which was presided over by a delegate, vice-delegate, and various subordinates. In the states of the Church, by a decree of 1816, 17 delegations were established, but the number was several times altered. The delegate was always a prelate, and directly appointed by the pope. If he was a cardinal, he was called a legate, and his province a legation.—*Delegados del fomento* is the name given in Spain to the superintendents of the entire police administration of a province.

DELEGATION, in civil law, an act by which a debtor, with the consent of a creditor, procures another debtor in his place, and is himself relieved from the charge. At common law, it is the transfer of property from one person to another. Any person may delegate to another authority to act for him in a matter which is lawful and otherwise capable of being delegated. But the one to whom a power is delegated cannot himself delegate that power to another, since the dependence of the party originally delegating was upon him only, and not upon a third person.

DELESCLUZE, LOUIS CHARLES, 1809–71; a French politician, journalist, and agitator, who took a prominent part in revolutionary conspiracies in the time of Louis Philippe, in those of the republic of 1848, and of the empire. He was imprisoned for one of his articles in the newspapers, and was once transported to Cayenne. In 1868, he started the *Réveil* newspaper, one of the most radical of prints. He was a conspicuously desperate and reckless leader of the commune during the siege of Paris. He was killed on a street barricade, whether by accident or design is not known.

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DELF, a heraldic charge, representing a square sod or turf, the term being derived, it is supposed, from the verb to *delve* or dig. A delf tenné is the appropriate abatement for him who revokes his challenge, or otherwise goes from his word. See ABATEMENT.

DELFI'CO, MELCHIORRE, 1744–1835; an Italian writer on political economy. His first publication was a vindication of marriage against the loose views then prevalent. Another work, addressed to the king, had the effect of repealing vexatious restriction on the sale and exportation of agricultural produce. Other reforms of importance were due to his writings. During Joseph Bonaparte's brief reign he was councilor of state, and was employed in reconstructing the judiciary. When Ferdinand was restored he was made president of the commission of archives. He left a number of important critical works.

DELFT, one of the most ancient towns of s. Holland, is situated on the Schie, 8 m. n.w. of Rotterdam. It is intersected by numerous canals, which are crossed by many bridges. D. was once noted for its pottery (Delft-ware), and still manufactures earthenwares, but the coarse goods now produced under the name of "delft" are manufactured in England. D. has a good harbor (improved in 1893), and has several interesting buildings, one of which, the town-hall, is a picturesque and richly adorned edifice. The new church contains a monument more ornate than tasteful, to the memory of prince William I. of Orange, who was assassinated here 10th July, 1584. It also contains the tomb of Grotius, and the burial-vaults of the present royal family of Holland. The old church, a building of some note, contains the tomb of the naturalist Leeuwenhoek, and of the celebrated admiral Tromp. D. has also a state arsenal, a college where all matters connected with the management of the dikes are taught, a gymnasium, and infirmary. There are manufactures of woolen cloths, carpets, tobacco-pipes, etc. Pop. '95, 31,964.

DELFTSHA'VEN, an old t. in s. Holland, is situated on the Maas, 2 m. w. from Rotterdam. It is defended from floods by three strong dikes. The principal buildings are the Reformed church, which is a handsome cruciform building, the Roman Catholic church, and the town-house. There is some trade and shipping, but the chief sources of wealth are distilling spirits, beer-brewing, iron-founding, ship-building, sawing wood, refining sugar, etc. Pop. 13,000.

DELGA'DA, or PONTA DELGADA, a city in St. Michael, one of the Azores, on the s. side of the island; 37° 45′ n., and 20° 40′ w.; pop. '90, 16,767. It has a large trade in fruit, grain, etc.

DELHI, the name of an executive district and also of a division or commissionership in the Punjab, formerly in the North-west Provinces.—The *district* is situated in 28° 24′ to 28° 54′ n. lat., and 76° 49′ to 77° 29′ e. long., having an area of 1290 sq. m. It consists of a strip of land along the w. bank of the Jumna, in length about 75 miles, and in width from 15 to 23. To the south the district is rocky and barren, the soil being fertile only when irrigated, but in the north, and along the river bank the land is alluvial. The chief products are grain, sugar-cane, cotton and building stone. The district is traversed by the Rajputana state railway, and Delhi, the capital, is on the East India and Punjab railways. The pop. in 1891 was 639,000. The *division* of D. has an area of 15,530 sq. m., and had in 1891 a pop. of 4,436,000. It comprises the districts of Delhi, Goorgaon, Kurnal, Hissar, Rohtak, Ambala, and Simla.

DELHI (ancient name, *Indraprestha*, or *Inderput*; Mohammedan name, *Shahjehanabad*), a celebrated city of northern India, in 28° 39′ n. lat., and 77° 18′ e. long., capital of the province and district of the same name, is situated on an offset of the river Jumna, at about a mile from the right bank of that river, and at an estimated elevation of 800 ft. above the level of the sea. The modern city, which was founded by shah Jehan in 1631, has a circumference of about 7 miles. It is protected by ramparts, bastions, etc., and is entered by 11 gates. The greater number of the streets in D. are narrow, but the Chandni Chauk is an exception, being 90 ft. broad, and 1500 yards in length, and intersected by an aqueduct. The other principal street is 120 ft. wide, and 1 m. in length. D. has many monuments of its former magnificence. The mogul's palace is one of the finest buildings in India. The Jumma Musjid, or principal mosque, was commenced by shah Jehan in the 4th year of his reign, and completed in the 10th, at a cost of £100,000. This magnificent building has been restored by the British government. The Delhi college was founded in 1792, and in 1829 the sum of 170,000 rupees was bequeathed to it by a minister of the king of Oude. The interest of this sum, together with grants from government, raises its annual revenue to 40,580 rupees. For each of the languages, English, Arabic, Persian, and Sanskrit, there is a separate department. According to the census of 1891, D. contained 192,580 inhabitants, of whom over 108,000 were Hindus, and 79,200 Mohammedans. D. has railway communication, by the East Indian railway, with Calcutta, distant 1019 m.; with Bombay, distant 870 m.; and with intermediate places. The mean temperature of the day has been ascertained, by observations extending over three years, to be as follows: Jan., 56°; Feb., 61°; Mar., 72; April, 83°; May, 91°; June, 92°; July, 86°; Aug., 83°; Sept., 83°; Oct., 77°; Nov., 65°; Dec., 58°. The vestiges of ancient D., on the e. bank of the Jumna, consisting of ruined tombs, gardens, serais, and palaces, cover an area of about 30 m. in circumference, and present a remarkable scene of desolation. The modern city is noted for its needlework, and here the shawls of Cashmere are embroidered in silk and gold. The D. goldsmiths are famous for the delicacy and

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beauty of their work. D. was the capital of the Afghan or Patan, and afterwards of the Mogul empire. It was taken by a British army under lord Lake, Sept. 8, 1803, and has ever since—if we except the brief period it was held by the mutineers in 1857—continued under British rule.

In our own time, D. has been rendered memorable by the events of 1857. The march on the city of the mutineers from Meerut, the terrible 11th of May, the explosion of the powder-magazine by Willoughby and his heroic band, the tragic scenes that followed; the siege, the assault (Sept. 14), when the city was won (Sept. 20) gate by gate and quarter by quarter—a success saddened by the death of the gallant Nicholson; the subsequent daring capture of the king of D. by Hodson of Hodson's horse, and the capture and shooting of his miscreant sons by the same officer, are historical facts still fresh in the recollection of the world. See *The History of the Indian Revolt*, published by the Messrs. Chambers in 1859; *The Punjab and Delhi in* 1857, by the Rev. J. Cave Browne, M.A. (Edin. and Lond., 1861); *Twelve Years of a Soldier's Life in India*, edited by the Rev. George H. Hodson, M.A. (Lond., 1859); Hunter's *Imperial Gazetteer*, 1881.

DELIA, a festival of Apollo, held in Delos, including athletic and musical contests, for which the prize was a branch of the sacred palm. The Athenians, who ascribed its establishment to Theseus, took especial pains to maintain the splendor of this festival.

DELIBES, Clement Phillibert Leo, composer, b. in France, in 1836. He studied at the Paris Conservatoire, where he won many prizes, and in 1853 became accompanist at the Théâtre Lyrique, and organist at Saint-Jean et Saint-François In 1865 he became second chef de chant at the Opéra, and in 1880 was made professor of composition in the Conservatoire. In 1884 he became a member of the Institute, succeeding Victor Massé. Delibes became popular with his first operetta, brought out in 1855, and of late years wrote a number of high-class ballets. He was one of the best writers of light and brilliant music of the modern French School. His works include the operas, *Jean de Nivelle*, 1880, and *Lakmé*, 1883; and the ballets, *Coppélia* 1870, and *Sylvie*, 1876. He died in 1891.

DEL'ILAH (Heb. the languishing) is the name of a Philistine woman whom Samson loved. By her flattering blandishments, she obtained from him the secret that his God given strength lay in his locks; and having cut these off while he lay asleep, she then treacherously betrayed the strengthless warrior into the hands of his enemies.

DELILLE, Jacques, a French poet, was born at Aigues-Perse, in Auvergne, June 22, 1738, and received his education at the collége de Lisieux, Paris. He first occupied the position of instructor at the colleges of Beauvais and Amiens successively, and was afterwards appointed to a professorship in Paris, at the collége de la Marche. Here he published various poetical effusions, the most considerable of which was a translation of the *Georgics* of Virgil—a work which appeared in 1769, was distinguished by its grace and elegance of style, and met with a most enthusiastic reception. In 1774, he published *Les Jardins*, the success of which, however, was not equal to that of his *Georgics*. The comte d'Artois presented him with the abbey of St. Severin, or rather with its revenues, for he did not insist on D. becoming a priest. His poem *L'Imagination* was written during a visit which he made to Constantinople in 1784, in the suite of comte de Choiseul-Goubbier, the French ambassador to the Ottoman court. On his return, he was elected professor of *belles-lettres* at the university of Paris, and of Latin poetry at the college of France. At the revolution in 1789, however, he lost all his property. He afterwards removed to Switzerland, where, in 1800, he published *L'Homme des Champs*. In 1801, he visited London, published a translation of *Paradise Lost*, and in that same year, having been solicited to return to Paris, he re-entered the academy and the college there with which he had formerly been connected. He died 1st May, 1813.

DELIQUESCENCE is the term applied to the property which certain substances have of absorbing moisture from the air, and becoming damp, and even running into liquid. Caustic potash, and the chlorides of calcium and magnesium, are examples of substances which undergo this change.

DELIRIUM (from Lat. *deliro*, I am furious), a state of deranged mind, in which the intellect and the judgment are perverted or lost, while the imagination and the passions are often excited, or at least left without control. The result is an incoherent or totally disordered course of action and speech, frequently attended by delusions, or unreasoning belief in supposed facts, which the sound mind at once perceives to have no existence in nature. The nature, extent, and variety of the delusions, and the degree to which the control of the reason over them is lost, may be said to indicate the type of delirium to which the patient is subject; and in some instances, the cause of the disease is pretty decidedly shown forth by the prevailing impressions on the mind and senses. Referring to the article insanity for the description of maniacal delirium, or mania, and to the article fever for that of typhoid delirium, or typhomania, we may confine ourselves in the present article to a slight sketch of the delirium arising from habitual intoxication, the *delirium ebriosorum* or *potatorum* (of drunkards), or, as it is more commonly called, from the bodily tremors that accompany it, *delirium tremens*. This disease is not to be confounded with the mere paroxysm of intoxication, and still less, if possible, with the insane craving for drink, or dipsomania (q.v.). It is, on the

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contrary, often found in persons who have not been recently intoxicated at all, though of persistently intemperate habits, and in whom the desire for drink, as well as for food, has been entirely suppressed by the access of the disease. It is a true though usually a temporary form of insanity or of mania, brought on by the habitual poisoning of the nervous system, over a long course of weeks or months, by alcoholic liquors; and it is not going too far to say that it is rarely, if ever, induced by a single debauch, at least in its aggravated form. Delirium tremens is characterized by a restless, irritable state of the nervous system, rather than by furious paroxysms of excitement (though these are not rare); by constant though ill-regulated and ineffectual attempts of the patient to occupy himself; by spectral illusions, or the vision and hearing of non-existent objects; by tremors of the hands and tongue; by prostration of appetite; and by great wakefulness, the want of sleep being often protracted over many days and nights, and forming, with the constant excitement of the senses, and the prostration of the vital powers from deficient nourishment, the true source of danger in this disease. The main elements in the cure are careful nursing, and the use of all means to secure sleep, and re-establish the digestion. Opium, hyoscyamus, and antimony, are used in some cases, and tonics with laxatives in others; chloroform has also been employed. In certain cases, stimulants are required for a time; but none of these remedies ought ever to be used except under the best medical advice, for there is little doubt that delirium tremens is one of the diseases where the rash employment of strong medicines is extremely dangerous to life, and where good nursing and food, without other remedies, will usually succeed. Where proper protection and vigilance cannot be otherwise secured, the patient should at once be transferred to the nearest hospital or lunatic asylum; and if the attacks have been repeated, he should be detained for some time after his recovery. See DELIRIUM TREMENS.

DELIRIUM EBRIOSUM, a term intended to denote a form of acute mania, having intoxication for its exciting cause. It is often mistaken for delirium tremens (q.v.), and doubtless has frequently been dealt with as such in criminal cases. It originates either from a single fit of intoxication, or a short course of intemperance—frequently of periodical occurrence—in those who are mentally excitable from hereditary peculiarity of constitution, or from some previous injury of the head, and who may have experienced some cause for depression of spirits. It is marked by an uncontrollable desire for drink, which, when gratified, only leads to further imperious demands, until the thing itself is loathed, and a fit of sickness brings about recovery. In the course of the paroxysm, however, more or less of indecorous conduct or wild and vicious passions are displayed; so that, unless the affected is restrained, and stimulants withdrawn, violence is apt to be offered to any one coming in the way. It is in this state that homicide and murder are so frequently perpetrated. On the delicate question of legal responsibility connected with this state, we do not here enter.

DELIRIUM NERVOSUM OR **TRAUMATICUM**, a term given by Baron Dupuytren, the celebrated French surgeon, to designate an attack of delirium with tremors, which frequently supervenes on severe bodily injuries, such as gunshot wounds, burns, and fractures—chiefly met with in large hospitals—in the case of persons of weakly constitution, and who are irritable and nervous, and have been intemperate in their habits. It has been considered by some as identical with delirium tremens (q.v.), but it only simulates that affection, being but a symptom of a sympathetic fever, having a typhoid character.

DELIRIUM TREMENS is the term given to a disease originating from the abuse of alcoholic stimulants by those of a nervous and irritable temperament, characterized by a combination of delirium with muscular tremors. The tremors are general, but chiefly of the hands, and of the tongue when protruded; and the delirium is of a muttering, sight-seeing, bustling, abrupt, anxious, apprehensive kind. The individual affected cannot follow out a train of thought, explain an illusion or perverted sensation, or perform any act correctly; and although at one moment partially conscious and rational, is the next incoherent and excited by the most ridiculous fancies of a spectral kind, such as visitors in the shape of devils, cats, rats, and snakes, or by alarming occurrences, such as robberies, fires, and pursuits for crimes. All this is ushered in and attended by complete sleeplessness; and during the attack, in an uncomplicated form, there is no violence or ferocity of demeanor (see article DELIRIUM EBRIOSUM), although mischief to himself or others may be done under false impressions; and he is easily pleased by gentleness and indulgence, and fretted by restraint and opposition. The face has generally a pale dirty color, and anxious expression; eyes startled but lusterless, sometimes considerably suffused, and the pupils not contracted, unless under treatment with opium, or when inflammation of the membranes of the brain has supervened; skin warm and moist, often perspiring copiously; tongue sometimes loaded, but generally pale, moist, and remarkably clean; appetite small, but the individual will often take whatever is presented to him; thirst by no means urgent, with seldom or never any craving for spirituous liquors; alvine evacuations bilious and offensive; urine scanty, high colored, and often albuminous; the pulse usually ranges from 90 to 120, and is generally soft, but of various degrees of fullness and smallness. The precursory symptoms are not peculiar to or pathognomonic of this disease, but common to many other febrile affec-

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tions implicating the functions of the sensorium, of the circulation, of digestion; and the paroxysm—distinguished by the above phenomena—runs a remarkably uniform course, independently of age and constitution. In genuine uncomplicated cases—that is to say, when not precipitated by other illness, such as bronchitis, pneumonia, erysipelas, and fever; or some accident, such as contusions and fractures—when the illness is more of the nature of the delirium traumaticum (q.v.)—the paroxysm runs its course in from two to three days, and terminates in sleep, from which the individual generally awakens convalescent.

The above description has been taken from a paper by Dr. Peddie, of Edinburgh, referred to underneath, whose views shall here be further developed. Previous to its publication, the generally received opinions regarding the essential nature of D. T. were, that it is a disease of exhaustion or irritation of nervous power, and that it has the habitual abuse of intoxicating liquors for its predisposing, and the abstraction or diminution of the accustomed stimuli for its exciting, cause; and consequently, that the proper treatment consists in the continuation of stimulants—"a hair of the dog that bit"—together with large opiates to act on the same principle, and force on the salutary, or what has been called the critical sleep. Since then, however, a great revolution has taken place in the views of the medical profession regarding the pathology and treatment of D. T.; and in consequence of this, a fatal result in a genuine case of the disease now seldom or never occurs, where these views are understood and acted on.

It has been shown that the more the history and phenomena of the affection are examined, the greater will the difficulties surrounding the second part of the proposition above stated become. It has been shown that the affection is specific and peculiar, uniform in its symptoms and progress; and that it is essentially a form of nervous poisoning—a toxicological result from the accumulation of alcohol in the system through the continued abuse of stimulants. It has been observed that the alcohol—in whatever way it may be atomically changed or chemically combined—acts on the nervous pulp of the brain through the medium of the circulation, and sets up in it an alcoholism or alcoholic erethism, manifested by a certain amount and kind of exhaustion of the cerebral and muscular functions, together with decided over-action in the meningeal vessels; and that the alcoholic principle, although acting at first slowly, begins ere long to poison the gray matter of the brain, so that every additional drop thereafter brings it more and more into a poisoned condition, until at length, unless arrested by judicious treatment, the state of irritation tends to inflammatory action and serious encephalic mischief. While, therefore, the first part of the above proposition is true—though explainable in a very different way from formerly received opinions—the second part, viz., that the diminution or abstraction of the accustomed stimulus is the exciting cause of the disease, is altogether untenable. Analogy will not bear out the assertion. Mercurial fumes, or the oxides of mercury, when long inhaled or absorbed into the body, as in the case of quicksilver miners, gilders, and others, in the course of time produce an attack of shaking paralysis—the *tremblement mercuriel* of the French pathologists; but will the workmen thus long exposed be more likely to become affected with tremors when removed from this poisonous atmosphere and occupation, than if continuing at their work? The reverse is well known to be the fact, not only in the case of such artisans, but of those who are beginning to suffer in a somewhat similar way from lead-poisoning. In both affections, when the symptoms are precursory or recent, a cure can be effected only by removal from the injurious occupation; otherwise, the symptoms deepen with hourly increasing rapidity, until tremors are succeeded by sleeplessness, delirium, and ultimately coma. Then, too, for example, salivation from any of the preparations of mercury, and narcotism from any opiate, are not intensified by withdrawing these agents after a certain point is reached. On the contrary, a continuation beyond that stage, particularly in some kinds of constitution, more rapidly develops their peculiar physiological manifestations; and now, an infinitesimal dose will do what a large dose in an earlier stage could not. Thus is it with alcoholic stimulants in the production of delirium tremens. In those of a highly sanguine temperament, and of a nervous irritable disposition, the effect of a certain length of indulgence is to induce this condition (just as in subjects with the tendency to gout, a certain amount of high-living is apt to produce an attack of that affection), and beyond that stage, a small quantity of alcoholic stimulus will keep up and deepen the effect, which, previously, a large dose would not do, or, in another individual, could not produce, whatever quantity is imbibed. Thus is explainable the very common erroneous statement made in regard to an individual affected with D. T.; that although for a considerable time he had systematically indulged in considerable quantities of spirits, wine, or malt liquor, or in all of these, yet for a week or two he had drunk very sparingly, and, within the last few days, little or none; indeed, that he was now suffering from the withdrawal of his wonted stimulus, in meritorious efforts to free himself from a habit of which he had begun to be ashamed. All this seems plausible: but the statement should rather have been that, although consuming large quantities of drink at one time, he had felt latterly a smaller quantity affect him; that he then reduced still further the amount, but experienced an equal if not greater constitutional effect therefrom; and thus, from day to day, reduction was forced on him by his own sensations of gastric irritation, nervous excitement, and muscular debility—these feelings being, in fact,

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neither more nor less than the premonitory symptoms of an attack of D. T., and just what might be looked for on the view that the alcoholic principle is in such instances a cumulative poison, and the exciting as well as the predisposing cause of the affection. That such is the true solution of the problem, cannot be doubted; and if a suspension or diminution of habitual supplies of stimulants be at any time followed by symptoms of D. T., this is not to be regarded as the result of the change in the practice of the individual, but as occurring in spite of it, and because the constitutional effect is already produced, and the premonitory stage of the disease begun. In a considerable number of instances, drink is taken freely up to the period when the disease is developed, there being no diminution of the quantity consumed, and no interval in the practice; and when there really is some diminution from the amount of previous supplies, it is on account of the system being already affected so much that a less quantity now produces a greater or equal effect. On the other hand, it may be safely averred, in contradiction to the popular error, that although stimulants are at once taken away from the habitual dram-drinker, a paroxysm of D. T. will not be produced if the peculiar diathesis is not yet established, and the precursory symptoms of the disease are not already begun. He may experience much mental disquietude and physical discomfort, and feel weak for a time, just as a gourmand would feel lowered and depressed by the abstraction of his accustomed good living; but this would soon pass off, without the occurrence of the usual signs of D. T., more especially without those spectral illusions or phantasms, which are common to poisonings with several other agents of the narcotico-acrid class.

It seems unnecessary to add more on this part of the subject, than that experience derived from some of our large prison-establishments shows that while fully three fourths of the criminals committed belong to the intemperate classes, and a large number, especially of the debtor class, are habitual drinkers up to the moment of admission, no bad effects are observed from the sudden withdrawal of the wonted stimuli, and the substitution of prison-fare.

In regard to the treatment of this remarkable disease, it is evident, from a common-sense consideration of its phenomena and pathology, that the non-stimulating and non-opiate plan must be the safest and best. If more spirits deepen the paroxysm, by producing greater cerebral determination, then why administer even one drop additional? And if opiates combined with spirits, or given alone, act in the same manner, and tend to occasion congestion in the blood-vessels of the brain, why run the risk of inflammation, convulsions, and coma, in an endeavor to force on the salutary sleep? It must not be overlooked that this sleep is the normal termination of the paroxysm, and is not to be viewed as a part of the affection, or in the same light as we are accustomed to regard a critical sweat or other discharge. It indicates diminished activity of the cerebral circulation and functions, and the commencement of convalescence. Hence, in a large proportion of instances, the sleep will take place spontaneously, and it will be safer to do nothing at all. The object, therefore, of treatment should rather be to remove all hindrances to sleep than to force it. In the more severe cases, this is best done by a moderate and well-regulated course of tartrate of antimony, the action of which, in this affection, appears to be remarkably sedative. It greatly diminishes excited action, induces weariness of muscle, general nervous exhaustion, and mental languor. It thus removes all obstacles to the occurrence of the salutary sleep, and favors it; and when the individual exhausted seeks his couch, he finds repose—not as a drugged sleep, but naturally and profoundly—awaking in general with restored reason and muscular control. Digitalis has been given with the same view, also ipecacuanha and aconite; but none of these answer the various ends so well as antimony. In the milder cases, however, no medicine is required, and it seems enough to do in such, what is essentially necessary in the severer attacks—to support the strength—the organic functions of life—by suitable nourishment, such as soups, *café au lait*, and white-of-egg, and to soothe in every possible manner the excited feelings of the patient. Nothing is more hurtful in delirium tremens than restraint, particularly that of the strait-waistcoat. It increases the cerebral excitement by the never-ceasing struggles for liberty which ensue, so that fatal convulsions have very frequently been the result. All the control required is the presence of one or two judicious attendants, who will humor the patient in his whims and fancies; who will speak and act regarding them so as to assure him of safety, and to relieve him of that apprehension which is the most characteristic feature of the delirium; and who will mildly but firmly interpose, if he attempts anything which may accidentally prove injurious to himself or others.

DELISLE. See LISLE, GUILLAUME DE.

DELITZSCH (named after the Slavonic *Deleczen*, once dominant there), a t. of Prussian Saxony, 15 m. n. from Leipsic, with which it is connected by railway, on the right bank of the Lobber, a small river. It is an old but well-built town, and has manufactures of tobacco, woolen cloth, and hosiery. It is the capital of the circle D., which contains rich coal mines. Pop. '90, 8949.

DELITZSCH, FRANZ, b. 1813; a German theologian, educated in Leipsic; in 1846, professor of theology at Rostock. In 1850, he became one of the strongest supporters of what is called the Erlangen school, or the strictest orthodox theology. He has written much on theology, and on oriental philology. In 1863, in company with Kiel,

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he began the preparation of a complete commentary on the Old Testament. He d. in 1890. His son, JOHANNES, 1846–76, was theol. prof. at Leipsic.

DE'LIUS, NIKOLAUS, b. Bremen, 1813, a graduate of Bonn, who from 1855 on, held the professorship of Sanscrit, and of Provençal and English literature, in that university. He published in German a critical edition of Shakespeare. He d. 1888.

DELIVERY. See MIDWIFERY.

DELIVERY IN SALE. See SALE OF GOODS.

DELIVERY OF A DEED. See DEED.

DELLA CRUSCAN SCHOOL. About the year 1785, a number of English residents at Florence endeavored to amuse their lagging hours by writing verses, which they published under the title of *The Florence Miscellany*. The insipidity, affectation, and fantastic silliness of these productions transcend all belief; yet such was the poetic destitution of the period, that they soon found a crowd of admirers and imitators. Taking the name of an academy at Florence (see ACADEMY), the Della Cruscans now began to print their precious lucubrations in England, chiefly in two daily newspapers called *The World* and *The Oracle*. "While the epidemic malady was spreading from fool to fool," as Gifford pungently says, one of the brotherhood, a Mr. Robert Merry, came over from Florence, and "immediately announced himself by a sonnet to Love." It was answered by a certain Anna Matilda, who (as was the custom) praised it immoderately in language even more absurd than Merry's own. According to Gifford, "the fever now turned to a frenzy: Laura, Maria, Carlos, Orlando, Adelaide, and a thousand other nameless names, caught the infection; and from one end of the kingdom to the other all was nonsense and Della Crusca." Retribution, however, came (for Nemesis watches the course of poetry as sharply as that of politics). In 1794, Gifford produced his *Baviad*, and, in 1796, his *Mæviad*. Rarely has literature witnessed such a scalping. It completely killed the school, and, indeed, it is only in these two poems that the memory of most of the unhappy Della Cruscan songsters has been preserved—an immortality which may be compared with that conferred by the *Newgate Calendar*.

DELLYS, a seaport t. of Algeria, 49 m. e. from Algiers. The French part of the town has wide streets, and a square planted with trees. The Arab part, which is greatly more populous, retains its old character: its streets are narrow and tortuous. The climate of D. is reckoned very salubrious. The vine and the olive succeed well in the neighborhood. *Bechena*, a kind of sorghum or durra, is grown. There is a trade in grain, oil, and salt. Pop. 3,000.

DEL NORTE, a co. in n.w. California, on the Oregon border and the Pacific ocean, intersected by the Klamath river; 1500 sq.m.; pop. '90, 2592. The surface is mountainous, and mostly covered with timber. Gold and copper are plentiful. Agriculture is the chief business. Co. seat, Crescent city.

DELOLME, JEAN LOUIS, b. at Geneva in 1740, was originally an advocate in his native town, but on account of certain political disturbances which took place there, and in which he had shared, he was forced to leave it. He went to England, where, in spite of his literary activity, he lived for several years in great poverty. He returned to his native country in 1775, and died at a village in Switzerland, July 16, 1806. D.'s principal work is *Constitution de l'Angleterre, ou Etat du Gouvernement Anglais comparé avec la Forme Républicaine et avec les autres Monarchies de l'Europe* (Amsterdam, 1771); English translation by the author himself (Lond. 1772). In 1772, he also published in English, *Parallel between the English Government and the Former Government of Sweden;* ten years later, his *History of the Flagellants, or Memorials of Human Superstition;* and, in 1796, an *Essay containing Strictures on the Union of Scotland with England*. His work on the British constitution, although not reckoned of great value by English critics, contains some acute observations regarding the advantages of a limited monarchy.

DE LONG, CHARLES E., d. 1876; a citizen of Nevada; was appointed minister resident to Japan, 1869; and in the following year raised to the rank of minister plenipotentiary. He remained in Japan until 1873, his term of office comprising the eventful period which witnessed the overthrow of the daimios and the assumption of absolute power by the Mikado.

DE LONG, GEORGE WASHINGTON; 1844–81; b. New York: graduated at the Naval acad., 1865; received rapid promotion, and rose to be lieut., 1869; was navigating officer of the *Juniata*, 1873, and visited the Arctic seas in search of the lost *Polaris*. Though unsuccessful he was anxious to continue the search but was refused permission to accompany the *Tigress* on the expedition which proved successful. His passion for Arctic adventure could not be subdued; he induced Mr. J. G. Bennett to fit out the ill-fated Jeannette expedition, received governmental permission to take charge of that vessel, 1879, and perished in the subsequent catastrophe. See POLAR EXPEDITIONS.

DELORME, MARION, a Frenchwoman, whose name figures too prominently in the history of the 17th century. She was born about 1612, at a village near Châlons-sur-Marne, and came at an early period of her life to Paris, where her great beauty would easily have secured for her a good match, had she not been inclined to a life of licentious intrigue. Almost all the distinguished men of the age were her "lovers." During the first disturbances of the *Frondeurs*, her house was the rallying-point of the chiefs

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of that party, and in consequence, Mazarin was about to imprison her, when she suddenly died at the age of 39. A curious tradition sprang up in France during the next century, to the effect that Marion had *not* died, but escaped to London; that she had returned to Paris in 1682; that she, meanwhile, had been thrice married—first, to a lord, second, to a robber-chief, and third, to a procurator of finance; and, finally, that she died in 1706, or, as others say, in 1741, when in her 129th year. Victor Hugo has made her the subject of one of his historical dramas.

DE LOUTHERBOURG, PHILIP JAMES, 1740–1812; of a Polish family, but b. at Strasburg, where he was naturalized, educated in the university, and intended for the ministry. His inclinations, however, led him to painting, and he studied in Paris under Van Loo. He speedily made a name and won high rank. He was elected to the French academy while under the required age. He had some eccentricities, which constantly appeared in his work, especially in his titles, as, when he painted a group of asses he called them "Father and Mother," "Little Fanfan," "Aunt and Uncle from Brittany, Cousin Germain," and the "Perruquier of all the Family." He traveled in Switzerland, Germany, and Italy, and became celebrated more for mechanical construction than for painting. One of his mechanical contrivances was a model theater, where he cleverly represented the moon and stars by lights, and running water by sheets of metal and gauze with loose threads of silver. In London, he was employed by Garrick to superintend the mechanism and scene-painting of Drury Lane, which he did with remarkable success, making a new era in the adjuncts of the stage. The Christmas pantomime of 1781 introduced these novelties, to the surprise and delight not only of the public, but also of artists. The green grass actually became russet, the moon rose and lighted the edges of the passing clouds, and all England was captivated by effects which we now scarcely notice. A still greater triumph was in his mechanical representation of the rise, progress, and result of a storm at sea—the one which had just destroyed a great East Indiaman. The same show gave "The Fallen Angels raising the Palace in Pandemonium." At the same time his painting went on, and he produced "Lord Howe's Victory off Ushant," and other large pictures for the Greenwich hospital gallery. His restless spirit led him to dabble in magic, and he joined the famous Cagliostro for a time. He sought the philosopher's stone, and found a reason for his ill-success in the fact that a relative stole in upon him and broke his crucible at the critical moment.

DE'LOS (called also in ancient times Asteria, Ortygia, Cynthus, etc.), an island in the Grecian archipelago, the smallest of the Cyclades, is situated between the islands Rheneia and Mykonus, in lat. about 37° 28′ n., and long. 25° 17′ east. According to the mythological account, it was at first a floating island, but was fixed to the bottom by Zeus, in order that it might become a safe abode to Leto, who, about to bring forth Apollo and Diana, was seeking a refuge from the wrath of Hera. Its earliest historical inhabitants were Ionians, and it appears to have been the center of a great periodical festival held in honor of Apollo, both on the mainland and in the islands. In 426 B.C., D. was purified by the Athenians, all the tombs were removed from it, and it was declared pollution for any birth or death to take place on it. Four years after, the inhabitants of Athens expelled the Delians from the island. After 146 B.C., when Corinth fell, D. became the seat of extensive commerce. Its sacred associations, its great festival, its excellent harbor, and its situation in the direct route from southern Europe to the coasts of Asia, all combined to render it a port highly favored by merchants. So great was the traffic of D., that it is said 10,000 slaves changed hands here in one day. After flourishing for a considerable time, it was devastated in the Mithridatic war, and from this calamity it never recovered. Pliny describes D. as being merely a rock, and only 5 m. in circumference. It was noted for its palm-trees, and also for its brass and the brazen vessels which it manufactured. The town of D., which stood at the foot of Mt. Cynthus, a granite crag of from 400 to 500 ft. high, is now a mass of ruins. Still, however, the remains of the great temple of Apollo, and of the colossal statue raised in his honor, may be distinctly traced, although shiploads of the more perfect architectural fragments were conveyed, centuries ago, to Venice and Constantinople. Since 1878, extensive discoveries have been made at Delos by the French archæologists.

DEL'PHI (now CASTRI), an ancient t. of Phocis, Greece, celebrated chiefly for its famous oracle of Apollo, was situated about 8 m. n. of an indentation in the northern shore of the gulf of Lepanto (Corinthian gulf), at the southern base of Parnassus, in lat. 38° 27′ n., and long. 22° 37′ east. Its original name, and that by which Homer invariably speaks of it, was Pytho. It stood in the center of a district renowned for its classical associations. Occupying the vale of the Pleistus, it was seated in a semicircle like the area of a grand natural theater, backed towards the n. by two lateral spurs of Parnassus. These lateral ranges extend e. and w. around D., and give rise also, from the point at which they approximate, to the famous fountain of Castalia, the holy water of the Delphian temple. The earliest inhabitants of D. are said to have come from Cycoreia, a town upon one of the slopes of Parnassus, the inhabitants of which are supposed to have been Dorians. From the Delphian nobles were at first taken the chief magistrates and the priests of the temple, while the pythia or female who delivered the oracle, at first always a young maiden, but latterly always a woman not younger than 50, was usually selected from some family of poor country-people. In the center of the

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temple was a small opening in the ground, whence arose an intoxicating vapor; and the pythia having breathed this, sat down upon the tripod or three-legged seat, which was placed over the chasm in the ground, and thence delivered the oracle, which, if not pronounced at first in hexameters, was handed over to a poet, employed for the purpose, who converted it into that form of verse. As the celebrity of the Delphic oracle increased, D. became a town of great wealth and importance. In the 8th c. before the Christian era, it had become famous not only in Hellas, but also among the neighboring nations. Here the Pythian games were at first celebrated in 586 B.C. The first stone temple at D., built by Trophonius and Agamedes, was destroyed by fire in 548 B.C., but was rebuilt at the cost of 300 talents, or £115,000, and was fronted with Parian marble. In 480 B.C., Xerxes sent a portion of his army to plunder the temple; but as they climbed the rugged path that led to the shrine, a peal of thunder broke overhead, and two huge crags tumbling from the heights crushed many of the Persians to death, while the others, struck with terror, turned and fled. It was plundered by the Phocians during the sacred war, and was attacked by the Gauls in 279 B.C., who, approaching by that route which the Persians had on a former occasion adopted, were repulsed by a similar supernatural agency. D. subsequently excited the rapacity of many potentates, and suffered severely by their attacks. Nero carried off from it 500 statues in bronze; Constantine also removed many of its works of art to his own capital. In the time of Pliny, the number of statues in D. was not less than 3,000, and within the temple for a long time stood a golden statue of Apollo.

The modern town of Castri now occupies the site of Delphi. Its situation is beautiful, and from it the traveler may command an excellent view of the ancient valley. Castri stands in the immediate neighborhood of the source of the still flowing Castalian spring. In 1892, the French Archæological Institute began extensive excavations in Delphi.

DEL'PHIN CLASSICS, a famous edition of the Roman classics, prepared by 39 of the best scholars of the time, under the editorship of Bossuet and Huet, tutors to the dauphin (q.v.), son of Louis XIV. The title-pages bear the words, "*In usum Serenissimi Delphini*," and hence the name. They have never been reprinted as a whole in England, but octavo editions of particular authors, such as Virgil and Horace, have been published for the use of schools. The D. C. possess little value in the eye of a scholar of the present day.

DELPHINAP'TERA, a genus of *cetacea*, of the family *delphinidæ*, agreeing with *beluga* (q.v.) in the want of a dorsal fin, but differing in having the snout produced into a slender beak, which is flattened transversely, and separated from the head by a marked furrow. *D. peronii*, the RIGHT WHALE-PORPOISE of the South sea whalers, is an inhabitant chiefly of the seas of high southern latitudes, but sometimes found even on the coasts of New Guinea. It is about 5 or 6 ft. long, black, with brilliantly white belly and snout. Its mouth is furnished with a great number of slender sharp teeth. *D. commersonii*, also found in high southern latitudes, is about the size of a porpoise, silvery white; the snout, tail, and pectorals tipped with black, and is described as one of the most beautiful inhabitants of the ocean. *D. borealis* was discovered by the United States exploring expedition in the North Pacific ocean.

DELPHINIA, a festival of Apollo, held annually on the 7th of April, at Athens, where the god was styled Delphinios. All that is known is that a number of girls carrying branches went in procession to the temple seeking to propitiate Apollo, it is supposed because of his influence over the sea, as this was about the time of the yearly opening of navigation.

DELPHINIDÆ AND **DELPHI'NUS**. See DOLPHIN.

DELPHINIUM. See LARKSPUR.

DELPHINORHYNCHUS, a genus of cetacea of the family *delphinidæ*, having one dorsal fin like the true dolphins, but the beak not distinguished from the forehead by a furrow. *D. bredanensis*, or *D. rostratus*, a species about 8 ft. long, black above and reddish below, has been thrown ashore on the French Atlantic coast. A much larger species, *D. coronatus*, attaining the length of 30 to 36 ft., is described as one of the whales of high northern latitudes, having been seen in numerous flocks among the ice-islands near Spitzbergen.

DELSARTE, FRANÇOIS ALEXANDRE NICHOLAS CHERIE, 1811–71; b. Solesme, France. He was a pupil of the Conservatoire, was for a time a tenor singer in the Opera-Comique, composed a few melodies, and wrote several romances; but is chiefly known as a teacher of singing and declamation. Many of the operatic and dramatic celebrities of the day owe a portion of their success to his careful training. He has sought, by an elaborate system, to present elocution as a science.

DELTA, a term applied to the land lying between the two or more mouths of a river, generally of triangular form, like the Greek letter Δ (delta). They are usually constantly increasing alluvial deposits pushed out into the sea by the action of the rivers. That of the Ganges is the largest, its base on the ocean being 200 m., and its sides about equal. The deltas of the Nile and the Mississippi are also very large.

DELTA, a western co. of Colorado, formed 1883 from part of Gunnison; about 1150 sq.m.; pop. '90, 2534. It is drained by the Gunnison river, and crossed by the Denver

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and Rio Grande railroad. Surface mountainous in part. Co. seat, Delta.

DELTA, a co. in Michigan, on Lake Michigan and Green bay, indented by two other bays, intersected by a branch of the Chicago and Northwestern railroad; 718 sq. m.; pop. '90, 15,330. It is hilly, well wooded, and contains abundance of sandstone and limestone. Co. seat, Escanaba.

DELTA, a co. in n.e. Texas, formed in 1870, lying on the Sulphur forks of the Red river, 266 sq. m. The soil is good, producing cotton, corn, etc. Co. seat, Cooper. Pop. '90, 9117.

DELTOID MUSCLE. See MUSCLE.

DELUC, JEAN ANDRÉ, 1727–1817; a native of Geneva, Switzerland, geologist and meteorologist. He was a merchant until nearly 50 years of age; but within that time, assisted by his brother, he collected a fine museum of mineralogy and natural history. After some political reverses he removed to England in 1773; where he was made a fellow of the royal society, and appointed reader to queen Charlotte, a position held by him for 44 years, and affording him ample time for study. Later in life he traveled in the principal European countries, and made a geological tour of England. He lived at the time when modern science was first seriously questioning the literal meaning of the six days of 24 hours each in the Mosaic account of creation; and he clung to the old idea, but was obliged to fall back upon a theory of wonderful volcanic action to account for the existence of the present continents.

DELUGE (through the French, from Lat. *diluvium*, a washing away, a flood). There is scarcely any considerable race of men among whom there does not exist, in some form, the tradition of a great deluge, which destroyed all the human race except their own progenitors. That the Noachian deluge, recorded in Scripture, covered the whole earth, was the universal opinion until towards the close of the last century. The organic remains, on which the science of paleontology is now founded, were regarded as its wrecks, and were held to prove that it had covered every known country, and risen over the highest hills. In the progress of geology, it soon became evident that most of the stratified rocks demanded an earlier origin than a few thousand years, and the influence of the deluge was consequently restricted to the slightly altered superficial deposits; but many of these were, after a few years, found to belong to a period vastly anterior to any historical epoch, and to have been produced by long-continued and steady agencies, differing totally from a temporary deluge. The present tendency of opinion among writers like the late Hugh Miller, is to regard the flood of Noah as partial and local, although the universality seems to be implied in the biblical description.

DE LUNATICO INQUIRENDO. See LUNACY.

DELVINO, a t. of European Turkey, in the province of Albania, beautifully situated on a hill-slope covered with olive and orange groves, about 47 m. n.w. from Janina. It is fortified, and is the seat of a Greek bishop. Pop. estimated at 7,500.

DELYANNIS, THEODORE, Greek statesman, was born at Kalavryta in 1826, was Minister for Foreign Affairs in '63, and fourteen years later he was associated with what was named the "Economical Ministry." At the Berlin Congress he acted as the representative of Greece. Was premier for a year ('85–6). On the defeat and resignation of M. Tricoupis, in Oct. '90, he was called upon to form a ministry, and took the oaths (Nov. 9th) on assuming office as President of the Ministry, Minister of the Interior, and Minister of War, retiring in 1892; was again premier 1895–97, being succeeded by Ralli, during the complications over Crete (q.v.).

DEMA'DES, a Grecian orator and demagogue of the 4th c. B.C.; a man of genius, but entirely unscrupulous, and ready to sell his political influence to the best customer. He was a favorite with Alexander, and for a bribe saved Demosthenes and other Athenian orators from vengeance. He was deprived of civil rights by the citizens of Athens, but was restored on the approach of Antipater, and sent to him with Phocion, as ambassador. Antipater had no difficulty in bribing him; but on a later occasion he found out his duplicity, and put him with his son to death.

DEMAND AND SUPPLY. The nature and influence of the law or agency so designated by political economists have been the subject of considerable dispute. It has sometimes been maintained as a ruling principle, that the demand for anything creates the supply. This has been denied, however; and it has been held that, on the contrary, the supply precedes the demand, since the article must be in existence before a purchaser goes to ask for it. Steam-engines, for instance, and India rubber galoshes, must have been invented and made before any one thought of purchasing them. The most convenient way, perhaps, of viewing the term demand and supply, is to consider it as applicable to articles in the market; and here we shall find that the demand and the supply are continually vibrating with a tendency to balance. Sometimes there is more of an article than will sell at a remunerating price, sometimes less; but there is always a strong tendency to a balance. Thus, on any day in London, the supply of beef or of fish may be less than the demand—that is to say, the trade may be so brisk that had there been a few more bullocks at Smithfield, or a few more salmon and turbot at Billingsgate, they might have been sold at remunerating prices. At the same time, there may happen to be an excess of both commodities at Windsor. It never will happen,

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however, that a supply suited for the London market will find its way to Windsor, or that no more will reach London than might feed Windsor—it would be as rational to expect the river Thames to reverse its course. This is the great law, then, by which the world is supplied with the necessaries of life. Every day the proper supply for the enormous consumption of London is on its way from the uttermost ends of the earth, as systematically as the sap is ascending to penetrate through all the branches of the tree. How impossible it would be to effect the same thing by artificial organization may be illustrated from the Russian campaign of Napoleon, where, despite of the most skilful and costly arrangements, one portion of the army were starving to death, while another were slaughtering their bullocks and leaving them to rot! It is necessary to keep in view the proper function of this law, which is in some measure defined under Competition (q.v.). The demand will not produce everything: no money will bring forth when wanted a Milton's *Paradise Lost*, or a Raphael's "Transfiguration." On the other hand, there are services beneficial to the world, or to a community, for which there is no demand in the commercial sense. There is a demand for almanacs, but none for the astronomical investigations on which they are founded. There is a demand for teachers of Latin and Greek, and for Latin and Greek school-books, but none for the profound scholarship necessary for keeping the knowledge of these languages alive; hence come scientific and scholastic endowments and establishments. See POLITICAL ECONOMY.

DEMARCATION, LINE OF, an imaginary line running due n. and s., 360 m. w. of the Azores, established by Pope Alexander VI. in 1494. All new lands discovered e. of this line were to belong to Portugal; all on the w. to Spain.

DEMAVEND, MOUNT, an extinct volcano of Persia. It forms the loftiest peak of the Elburz chain, which separates the low shores of the Caspian sea from the high table-land of Persia. Although no longer subject to eruptions, D. bears traces of its having been an active volcano within the most recent geological epoch. Its summit is conical, covered with sulphur, and rent by heated fissures. The crater is still visible, and the surface of the mountain is in many places covered with scoriæ. At its base hot springs give evidence of the continued existence of volcanic fire at no great distance beneath the surface. A great deposit of sulphur covers the summit of D., and is brought down to the plains in bags to be disposed of as an article of commerce. Although the path that leads to the peak is, for this reason, familiar to the inhabitants of the adjoining districts, the mountain was not ascended by any European till 1837. In Sept. of that year, Mr. William T. Thomson of the English embassy at Teheran, with the view of taking important bearings from a point which commands an extensive view of the shores of the Caspian, determined to reach the summit. He set out from the base with four guides, three of whom deserted him when they experienced the effect of the rarified atmosphere on their breathing. The first night he slept below the snow limit; the second night in a sulphur cavern near the summit, so highly heated that it was impossible to place the hand near a crevice of the interior. On leaving this place of shelter, the traveler's wet clothes were instantly frozen with a bitter blast from the Caspian. The height, as recently determined by the Russian survey, is 18,600 feet.

D. towers high above the neighboring mountains, the adjacent summits not exceeding two thirds of its elevation. At all times it has been a conspicuous object from the great trade route between India and the west, along the edge of the Persian table-land. It is not then to be wondered at that it is connected with the earliest Persian as Etna is connected with the earliest Greek traditions. There seems indeed more than an accidental coincidence between the fables which relate to the two mountains. According to the Greeks, the giant Typhon was buried under the volcanic region of Sicily, and the earthquakes and eruptions were caused by his efforts to escape. Fire proceeded from his mouth, and he was figured with one hundred snakes growing from each shoulder. Zohak, a personification of the bad principle, was in the same way supposed by the Persians to be buried under Demavend. He was figured with one serpent growing out of each shoulder; and in other respects he had much in common with the Greek monster.

DEMBEA, or **TZANA**, LAKE OF, in Abyssinia, is in lat. 12° n., long. 37° 15′ e., and is 40 m. in length, with an average breadth of 25 miles. It occupies part of an extremely fertile plain, situated at an elevation of some 6,000 ft. above the sea, and contains several beautiful islands, one of which is inhabited. The Blue Nile flows from this lake.

DEMBINSKI, HENRYK, a Polish gen., best known in Britain through his connection with the Hungarian revolution, was b. in the palatinate of Cracow, 16th Jan. 1791, entered the Polish army in 1809, took part in the invasion of Russia by the French in 1812, and was made capt. by Napoleon himself on the battle-field of Smolensk. He subsequently distinguished himself at Leipsic. After the fall of the empire, he returned to his native country, and lived in comparative obscurity for some time. The Polish revolution of 1830 called him again to arms. He obtained the command of a brigade of cavalry, and exhibited heroic courage at the battle of Kuflew. Afterwards, he made the campaign of Lithuania, under Gielgud; and arriving in Warsaw—having traversed

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the entire Russian lines—was made commander-in-chief of the national army. After the surrender of Warsaw to the Russians, D. went to France, where he published his *Mémoires sur la Campagne de Lithuanie* (Strasbourg, 1832). In 1833, he proceeded to Egypt, and entered the service of Mehemet Ali, but returned to Paris in 1835. On the outbreak of the Hungarian insurrection, he offered his services to that country, and Kossuth appointed him commander-in-chief of the Hungarian army. He drew up a plan of the campaign, but could not obtain the concurrence of Görgei, whose tardy arrival caused the loss of the battle of Kapolna (26th-28th Feb., 1849). Forced to retreat behind the Theiss, D. resigned his command, but subsequently consented to act under Messaros. He strongly urged the necessity of uniting the cause of Hungary with that of Poland, and proposed to lead an army into Galicia; but his advice was not taken. After the resignation of Kossuth, and the capitulation signed by Görgei at Vilagos (13th Aug., 1849), D. fled to Turkey. In 1850, he returned to France, and commenced to write his *Mémoires* on the Hungarian war. He continued to live in Paris till his death, which took place 13th June, 1864.

DEMEMBRÉ, or DISMEMBERED, a heraldic term to signify that the members of an animal are cut from its body.

DEMENTIA. See INSANITY.

DEMERA'RA, a district and river of British Guiana (q.v.). The river D. is about 350 miles in length, is 1¼ m. broad at its mouth, and is navigable by ships of considerable burden for 75 miles. Its affluents are numerous though small, and at its embouchure into the Atlantic it affords a spacious harbor, obstructed, however, by a bar. It has many settlements on its banks.

DEMESNE (Lat. *terræ dominicales. Dominicum*), in the present day, may be said to be the right which the owner in possession of lands in fee simple has in his estate. But the original signification of demesne was that portion of the lands of a manor (q.v.) which the lord of the manor reserved for his immediate use and occupation. The lands so reserved were either cultivated by the lord of the manor or his villeins (see SERF), and were thus distinguished from lands granted or subfeued to vassals for services to be rendered. So long as the practice of sub-infeudation continued, the demesne lands were a distinct and separate right; but the statute *Quia Emptores*, 18 Ed. I., having abolished sub-infeudations, and declared that on every transfer of land the feofee should hold of the lord paramount, all lands became of necessity demesne, being in the actual possession of the owner or his tenants.

DEMESNE, ANCIENT, a species of copyhold tenure (q.v.). Lands held in ancient demesne are said to have belonged originally to vassals of the crown. The services rendered were determinate, not variable at the will of the lord, and more honorable than those of copyhold in general. The tenants also were entitled to certain privileges and exemptions from feudal services. But in process of time, the character of the services appears to have varied; so that in the present day tenants in ancient demesne in some instances differ little from ordinary copyhold tenants.

DEME'TER. See CERES

DEME'TRIUS, the assumed name of four different persons who figure prominently in Russian history between the years 1603–13. In 1584, Ivan the "terrible" died, leaving two sons, Feodor and Demetrius, the former of whom ascended the throne, but proved a weak ruler, and was completely under the control of his brother-in-law Boris Godunoff; the latter, D., was brought up at a distance from the Muscovite court, and when only 9 or 10 years old, either accidentally killed himself, or, which is more probable, was put to death. In 1598, Feodor died also, and Boris ascended the throne, but his tyrannical measures rendered him very unpopular. In 1603, a strange story reached Russia. It was affirmed that D. was not dead, but had appeared in Poland. The *fact* was, that a person calling himself D., but who, it was asserted, was in reality a monk, named Grishka Otrepiev, belonging to the convent of Tchudoff, had found means to persuade prince Wisniewski in Lithuania, and afterwards Mniszek, palatine of Sandomir, that he was the true son of Ivan. The latter introduced him to Sigismund III., king of Poland, who saw in him a useful instrument for introducing Polish influence into Russia, and so aided him in his designs against Boris. Towards the close of 1604, he invaded Russia, repeatedly defeated Boris (who died April, 1605), and entered Moscow in June, the people receiving him with every demonstration of enthusiasm. He ruled for some months with vigor; but his manifest predilection for the Poles soon excited the Russians against him, and the arrival of his bride, Marina Mniszek, the daughter of the palatine of Sandomir, on the 12th of May, 1606, brought the discontent to a head. Sixteen days later, an insurrection broke out in the capital, headed by prince Wasili Shuiski. D. was slain, and a multitude of the Poles massacred. Wasili Shuiski now ascended the throne; but in the following year, an individual appeared, alleging that he was D., and that another had been mistaken for him in the Moscow massacre. He found a considerable number of adherents, especially when Marina acknowledged him to be her husband. The Poles also helped him, and for some time it seemed likely that he would succeed; but at length he was put to death at Kaluga, in 1610. The third *false*

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D. gave himself out to be the son of the first. After a brief career, he fell into the hands of the czar, and was strangled. The *fourth* made the same pretensions, but falling into the hands of the Cossacks, was carried to Moscow, where he was executed in 1613.

DEME'TRIUS I., POLIORCETES, king of Macedonia, son of Antigonous and Stratonice. At the age of 22, his father sent him against Ptolemy, who had invaded Syria. He was totally defeated near Gaza, but soon repaired the misfortune by a victory over Cilles. After other various successes, he led a fleet of 250 ships to Athens, and freed the people from the power of Cassander and Ptolemy, some time afterwards defeating Cassander at Thermopylæ. In the next campaign, he completely destroyed Ptolemy's naval power. In 301 B.C., he was defeated at Ipsus, and the fickle Athenians, who had worshiped him as a god, now deserted and reviled him. The loss of his possessions in Asia recalled him from Greece, and he established himself on the throne of Macedonia by the murder of Alexander, the son of Cassander, 294 B.C. Afterwards he had a stormy reign, and was finally forsaken in battle by his troops and made a prisoner, dying in confinement.

DEME'TRIUS II., grandson of Demetrius Poliorcetes; king of Macedonia for ten years. Little is known of his reign. He offered a slight opposition to the two patriotic leagues, and wrested Bœotia from the Ætolians. He died 232 B.C.

DEME'TRIUS I., SOTER, king of Syria; sent to Rome as a hostage during the reign of Antiochus Epiphanes. He escaped from confinement, and established himself on the throne. He fell in battle against the usurper Balas about 150 B.C.

DEME'TRIUS II., NICATOR, son of Demetrius Soter, lived many years in exile, but with the assistance of Ptolemy Philometer, whose daughter he married, he regained the throne of Syria. He was soon expelled for cruelty and vices; and Antiochus, infant son of Alexander Balas, was made king instead. After ten years of captivity, Demetrius once more regained the throne; but his wife Cleopatra, indignant at his subsequent marriage with a daughter of the king of Parthia, caused him to be assassinated, 126 B.C.

DEME'TRIUS III., EUCERUS, called also Eugertes, and Philometer; king of Syria. He recovered a part of his Syrian dominions, and held his court at Damascus. He assisted the Jews against Alexander Jannæus. In attempting to dethrone his brother Philip he was defeated by the Arabs and Parthians, and taken prisoner. Mithridates, king of Parthia, kept him in confinement until his death.

DEME'TRIUS, a sculptor of Attica, supposed to have flourished about 440 B.C. He was so close an imitator of nature that he was censured for reproducing her imperfections.

DEME'TRIUS OF BYZANTIUM, a peripatetic philosopher, supposed to have been the man who dissuaded Cato from suicide. Some portions of his writings are said to have been found at Herculanæum.

DEME'TRIUS OF SUNIUM, a cynic philosopher, disciple and afterwards antagonist of Apollonius of Tyana. Caligula, being desirous of counting a philosopher among his sycophants, sent a large bribe to Demetrius, who refused it, saying, "if Caligula wishes to bribe me let him send me his crown." Vespasian banished him because of his bitter speech. Seneca observes that nature made him to show mankind how an exalted genius may live uncorrupted by the vices of the world.

DEME'TRIUS, PHALE'REUS, so named from the Attic demos of Phalerus, a seaport of Athens, where he was born about 345 B.C., was distinguished as an orator and politician. Though descended from a family possessing neither rank nor property, yet by the resolute and persevering exercise of his abilities, he rose to the highest honors at Athens. Having been educated in the school of Theophrastus, he entered upon public life about 325 B.C., and soon made himself famous by the display of great oratorical talent. In 317 B.C., D. was placed by Cassander at the head of the administration of Athens, which office he discharged with such acceptance for nearly ten years, that the grateful Athenians, during that time, heaped all kinds of honors upon him, and erected to him no less than 360 statues. During the later period of his administration, he seems to have given himself up to dissipation; and when Demetrius Poliorcetes, king of Macedonia, approached Athens with a besieging army, in 307 B.C., D., having lost the sympathies and co-operation of the Athenians, was obliged to flee. All his statues were demolished except one. D. retired first to Thebes, but afterwards found refuge in the court of Ptolemy Lagi, at Alexandria, where he lived for many years, devoting himself to literary pursuits. On the death of his protector, D. was expelled from the court of Egypt, and retreating to Busiris in Upper Egypt, he is said to have died there from the bite of an asp, 283 B.C. D. was the last of the Attic orators worthy of the name. His style was graceful, insinuating, and elegant; bearing, however, in its luxuriousness and tendency to effeminacy, the marks of a declining oratory. The list of his works (50 in number) given by Diogenes Laërtius shows him to have been a man of most extensive acquirements.

DE'MI, or DE'MY (half). In heraldry, an animal is said to be demi when only the upper or fore half of it is represented. In inanimate objects, the dexter half per pale

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is usually intended, when it is said to be demi, though a *demi-fleur-de-lis*, for example, may be a *fleur-de-lis* divided per fess.

DE'MI-BASTION, in fortification, is a kind of half-bastion which frequently terminates the branches of a crown-work or horn-work, and which is also occasionally used in other places. See BASTION, CROWN-WORK, HORN-WORK.

DEMIDOFF, a Russian family who in Russia occupy a position as capitalists similar to that held by the Rothschilds elsewhere, and who are not more celebrated for their wealth than they are for their beneficence.—NIKITA D., the founder of the family, was a serf in the time of Peter the Great, but, leaving the place of his birth in order to escape being taken as a recruit, he afterwards became famous as a manufacturer of arms, and before his death, had amassed an immense fortune. In 1699, he established an iron-foundry, under the auspices of Peter the Great, in whose favor he had attained a high position, near Neviansk, on the eastern base of the Ural mountains; this being the first iron-foundry ever established in Siberia. He subsequently erected numerous other forges among the solitudes of the Urals, and realized from them very great riches.—AKIMFI D., son of the preceding, employed German workmen to explore the rich mines of gold, silver, and copper, that are found in the valley of the Irtish, and the upper reaches of the Obi. In 1725, he built, at the foot of the Magnetic mountain, in Siberia, a foundry called Nischneitagilsk, which is still the most important in all Siberia. The Russian government, sensible of the great service done to the country by the labors of such a man, conferred upon the enterprising metallurgist the title of counselor of state.—His son, PROCOPE, founded in 1772 a school of commerce at Moscow, intended to furnish a complete education for the sons of Russian tradesmen. This establishment was transferred to St. Petersburg in 1800.—PAUL D., cousin of Procope, also a man of energy, traveled extensively when young, devoting himself to the cultivation of the natural sciences. He presented to the university of Moscow a valuable museum of natural history, and founded also, in 1803, the Demidoff museum, at Yaroslavl.—NICHOLAS, count D., nephew of the preceding, b. in 1774, distinguished himself while young as an aide-de-camp in the war against the Turks. Later, he married the countess Stroganoff, and became a privy councilor and imperial chamberlain. His taste for the fine arts and for the natural sciences led him to travel extensively; he also caused the workmen whom he employed in his mines to travel, in order to acquaint themselves with the processes of foreign miners. In 1812, he fought at the head of a regiment which he himself raised and led against the French. His death occurred in 1828. A collection of his works, entitled *Opuscules d'Economie Politique et Privée*, was published at Paris in 1830. Of his two children, Paul and Anatol, the former died young, leaving the great bulk of his fortune to the latter, who was b. in 1810 or 1812, and was educated in France. He was always remarkable for his enthusiasm in letters and in the sciences. His principal book, published at Paris in 1839, and of which an English translation appeared at London in 1853, is entitled *Travels in Southern Russia and the Crimea, through Hungary, Wallachia, and Moldavia*. D., in 1840, married the princess Mathilde de Montfort, daughter of prince Jerome Bonaparte. After five years, the marriage, by which there had been no children, was by mutual consent dissolved. Demidoff died at Baden, 13th July, 1858.

DEMI-GORGE. See BASTION, GORGE.

DEMIJOHN (Fr., *Dame Jeanne*, Lady Jane, believed to be a corruption of *Demaghan*, a town of the Persian province of Khorassan, once renowned for its glass works), a large glass jar or bottle with a small neck, covered with wicker work.

DE MILLE, JAMES, 1837–80, was born at St. John, N. B.; was professor in Acadia college and Dalhousie college, 1860–80; wrote among others *Helene's Household* (1858), *Andy O' Hara* (1860), *The Living Link* (1870), etc.

DEMI-LUNE, in fortification, is a work constructed to cover or defend the curtain or wall of a place, and the shoulders of the adjoining bastions. It is composed of two faces, forming a salient angle towards the open country outside the place. It has two demi-gorges, formed near the counterscarp, and is surrounded by a ditch. See further under LUNETTE and RAVELIN.

DEMI-MONDE, the better class of courtesans in Paris and other cities, including a class whose reputation is a little above these, and yet not good enough to warrant their reception in strictly moral society. They are noticeable from the fact that the leaders among them have been for years the dictators of the fashions for women's dresses in Europe and America.

DEMING, HENRY CHAMPION, 1815–72; b. Conn.; graduate of Yale, and of Harvard law-school; a lawyer and politician, who held a number of state offices. He served in the union army during the civil war as a colonel of the 12th Conn. volunteers, and mayor of New Orleans. In 1864 he was a member of congress from Connecticut.

DEMIR-HISSAR ("Iron-castle"), a t. of European Turkey, in the province of Saloniki, in lat. 41° 12′ n., long. 23° 28′ east. It is situated on a tributary of the Karasu, at the foot of an old fort-crowned hill, is fortified, and contains several mosques and a Greek church. Pop. 8,000.

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DEMISE OF THE CROWN. That "the king never dies," is a maxim of the public law of Gt. Britain, in accordance with which, immediately on the death of the reigning monarch, the sovereignty passes to his successor, by the act of the law itself. No installation, proclamation, coronation, or other ceremony is required to vest the new sovereign in the regal office, and thus there is no interval or interregnum, and the royal dignity remains perpetual. The word demise has, in English law, the more general signification of a lease or conveyance, by which a man grants lands or tenements to another for life, for years, or at will; such estate being short of the lessor's own interest therein. It is thus, as it were, by a sort of courteous and royal analogy that it is employed to signify the death of the sovereign. "So tender," says Blackstone, "is the law of supposing even a possibility of his death, that his natural dissolution is generally called his demise, an expression which signifies merely a transfer of property."

DEMI-SEMI-QUAVER, half a semi-quaver, or the 32d part of a semi-breve. See NOTATION.

DEMIURGE (from Gr. *demos*, people, and *ergon*, a work, hence a handicraftsman, was the name given in the cosmogony of the Gnostics to the creator or former of the world of sense. He was conceived as the archon or chief of the lowest order of the spirits or eons of the pleroma; minging with chaos, he formed in it a corporeal animated world. He created man, but could impart to him only his own weak principle, the *psyche* or sensuous soul; therefore the highest, the really good God, added the divine rational soul, or *pneuma*. But the power of evil in the material body, and the hostile influence of the merely sensuous demiurge, prevented the development of that higher element. The demiurge holding himself to be the highest God, could not bring his creatures to the knowledge of the true Godhead; as the Jehovah of the Jews, he gave them the imperfect law of Moses, which promised merely a sensuous happiness, and even that not attainable; and against the spirits of the *hyle*, or world of matter, he sent only a psychical, and therefore powerless Messiah, the man Jesus. See GNOSTICS.

DEMMIN', a t. of Prussia, on the river Peene, on the borders of Pomerania and Mecklenburg, in lat. 53° 50' n., long. 13° 1' east. Besides the town proper, D. comprises three suburbs. It has four public squares and a town-house, and manufactures of woolens, linens, hats, and leather. It has also distilleries and breweries, and some trade in tobacco, gloves, etc. Pop. '90, 10,852. D., which is a place of some antiquity, was a walled and fortified town during the 12th century. It suffered considerably during the thirty years' war, previous to which it was of much more importance than it has since been.

DEMOCE'DES, b. 550 B.C.; a Greek physician. While on a visit to Sardis, he was seized by the Persians, and sent to the court of Darius, to whom he rendered such medical assistance that he was allowed to accompany a party of Persians on a secret mission to Greece. He managed to escape, or was rescued by his fellow-citizens.

DEMOCRACY (Gr. the rule of the people). It is interesting to trace the progress of this idea, which now plays so important a part. In Greece, whence we derive the name, it was understood to mean a commonwealth so constituted that the power was exercised by the body of the citizens (the *demos*), and not by an individual, or by a dominant caste. Democracy, therefore, stood opposed both to monarchy and aristocracy. Most of the republics of Greece, more especially that of Athens, were democracies in this sense. The name by no means implied the notion of an absolutely equal right in all citizens, still less in all men, to the exercise of political power. Neither the total absence of rights of all kinds on the part of the larger half of the population, the slaves, nor the distinctions recognized by law among citizens proper (e.g., the exclusion of the poorer citizens from office under the Solonian constitution at Athens), were considered incompatible with the nature of a democracy; though in regard to inequalities among citizens, the continually growing force of the democratic principle tended to their gradual extinction, and the transference of power to the mass of citizens without distinction. Aristotle regarded this as an encroachment of *ochlocracy* (mobocracy), the degenerate form of democracy, or democracy proper. Or more frequently, he speaks of democracy as the degenerate form of the polity (Gr. *politeia*). The polity with him was the form where the many govern for the common benefit.—*Polit.* III. chap. 5, and IV. chap. 6.

In modern history, we meet at the very threshold a state of society which may be called democratic. Among the German nations, we find an almost perfect equality of all freemen (i.e., all that were not slaves), and real self-government exercised by these freemen in each separate tribe. For the personal distinction enjoyed by certain families gave them no privileges over the other freemen, and where royalty existed, it could hardly be said to rule, since the king could do nothing without the concurrence of the assembly of freemen, and reigned not by mere birthright, but required the confirmatory choice of the people.

This condition of general liberty and equality gave place gradually to one of a quite opposite kind. Through the growth of the feudal system (q.v.), the majority fell into a more or less abject dependence upon a privileged minority. The mass of former

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freemen, now sunk into serfdom, were hardly distinguishable from those properly slaves, whose position, on the contrary, was become less dependent. The dominant class, the nobility, branded all that did not belong to themselves as "people," "commonalty," "canaille." Thus the term "people," which in the ancient republics implied the rights of citizenship, came to denote the masses that were without rights. The distinction between the dominant class and the mass of the people rested chiefly on two points—exclusive occupation in war, and the free possession of land, which was granted for warlike service alone.

But within this system of graduated dependence, from the monarch down through the aristocracy and their retainers in various degrees, there sprang up slowly an opposing element, which, as originating in the mass called the people, we may designate as democratic. It was not so much a new element, as the resuscitation of the old Roman municipal life, which had never altogether become extinct. It was of course in the cities that this fresh element first manifested itself. Here, instead of a lord with a group of dependents, there arose communities of men with equal rights and self-government. At the same time, a new material interest, that of movable property, the product of industry and commerce, began to claim recognition alongside of territorial possessions and nobility. In England, as early as the Anglo-Saxon times, a merchant who had made three voyages ranked with a thane; and soon after the Norman conquest, the cities were represented in parliament on an equal footing with the warlike aristocracy. This took place later on the continent, and never to the same extent, except in the cities of Lombardy and Flanders, where, at an early period, the citizen element entered the lists with the feudal and warlike. Even within the cities, the same contest was carried on between aristocracy and democracy. At first, it was only those carying on commerce on a large scale that asserted their right to take part in the municipal government of the towns; but the trades or guilds soon set up the same claims. These claims were pertinaciously prosecuted, and often led to bloody contests, but sooner or later were everywhere victorious. Thus was the basis of democracy widened; although the guilds also did not fail to manifest an aristocratic and exclusive spirit towards the body of the people not belonging to them, and with their restrictions and monopolies acted oppressively to the country population. It was not so easy for these last to break the bonds of feudal subjection in which they were held, or to acquire any political standing. Isolated attempts to throw off the yoke, by peasant insurrections and wars, failed, and only were followed by increased oppression. The abrupt division between the feudal possessor of the soil and the serfs under him continued long everywhere except in England. There the rigor of the relation began early to give way, and the transition was effected in such a peaceable and gradual way, that the English historian cannot say exactly how or when. For the greater part of the continent, it was not till the French revolution in 1789, and the impulse given by it to legislation in other countries, that the agricultural population acquired more or less complete freedom and equality with other classes.

Thus had one part after another of that "people," so oppressed and contemptuously thrown into the background by the dominant class in the middle ages, emerged from bondage, and successfully asserted a participation of rights that were at one time the privileges of a single class. The aristocratic principle of feudal society, the principle of exclusion, privilege, of the subjection of the majority to a minority, had given way to the democratic principle of the equal rights of all classes, of all callings and employments. But the development of this last principle was not yet complete. Those who had made good a position in the state alongside of the feudal aristocracy, formed in their turn an exclusive class, taking their stand on certain material grounds. Thus, the merchants, as representing large masses of capital; the guilds, with their privileged industry; the agriculturists, as possessors of land, however little: all these interests formed, as it were, another aristocracy within the democracy. They were democratic in their origin, and as compared with the class that was at one time exclusively privileged; but in another point of view they were aristocratic, since there still remained without a numerous body, which, instead of elevating to political power with them, they rather repelled, and treated much as the nobility had treated themselves. This residuary mass, which now came to be chiefly designated by the name "people," comprehended all those who possessed no capital, no privileged trade or calling, no land—nothing, in short, but their personal powers and capacities for work. This class forms at the present day by far the most numerous portion of the population in nearly all the civilized states of Europe. The designation "people," intended to be depreciative, is taken by them in the very opposite sense, and they ground upon it their claim to rule the state, as being properly the people, the numerically strongest class of the community. The preference given to the class of possessors, they look upon as groundless and absurd, just as these had judged of the nobility; they therefore claim perfect equality with them, especially in the exercise of the highest political rights. It is from this point of view that universal suffrage and the rule of mere numbers, without regard to possessions or other conditions, has been proclaimed as a self-evident consequence of the democratic principle.

With this there is connected in many quarters a still further extension of the idea. The same principles, it is said, that have dictated political reformations, call for a

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remodeling of the social arrangements of mankind; that the possessors of property, the *bourgeoisie*, ought to be deprived, not only of the political privileges they have hitherto enjoyed, but also wholly or in part of the material basis of those privileges, their property, so as to produce a perfect equality, political, material, and social, of all classes. This gives rise to a division of the democrats of the present day into two parties: the purely democratic party, aiming only at securing the political consequences of the democratic principle—universal suffrage, and the absolute equality of social rights; and the "democratic and social," who look upon the attainment of political rights as only a means of ultimately securing the general social equality of men.

There seems, however, to be a fundamental error in thus treating the relation between the possessionless class and the possessors as analogous to that between the serfs and lords of feudalism. The contest of democracy against feudalism was not primarily so much for equal rights as for this, that among the same people mere birth should not make one man privileged, and a ruler; another destitute of all rights, and bound to obey. It was a contest for personal freedom, the right for every man to use his powers for his own behoof, and not for that of a master; the right to the free possession of land, etc. Participation in political rights was chiefly prized as a guarantee for securing this personal and social liberty. Now, there is no such absolute distinction between possessors of property and non-possessors, as between the nobleman and *roturier* of the middle ages; the two classes run imperceptibly into one another. Still less does the one class exercise any right of controlling the personal freedom of the other in respect of labor and acquisition, as was the case in villenage and feudal servitude. Possession has endless gradations, and in the present day, he who had nothing at the outset often becomes a capitalist, and the reverse. There may be other reasons for wishing that there were less abrupt differences of possession, and greater social equality between the lower and middle classes than society actually presents (see SOCIALISM); but this by no means follows, necessarily from the notion of democratic equality. All that this notion requires, seems to be the removal of all privileges that destroy the unity and homogeneity of a nation, the establishment of complete personal and social liberty, and of the equality of all in the eye of the laws; and, in regard to political rights, or direct participation in the government of the state, such a form of constitution as will exclude no fixed class of citizens as such. All this, however, seems quite compatible with making the exercise of the different political functions dependent, in the case of each individual, on certain guarantees, and not admitting the whole body of the people to share in the government of the commonwealth at once, but only in proportion as increasing culture renders a wider circle capable of such functions. If we may judge from the example of England and Belgium, this is the way in which the real and steady progress of the democratic principle is best secured.

In France, the feudal principle, instead of a timely compromise with the democratic, as in England, came to a struggle with it of life and death. The consequence was that victorious democracy, instead of seeking to satisfy the practical wants of society first, and leaving the theoretical to be attained gradually, undertook to reorganize at one stroke the whole political and social fabric. In Germany, things took lately a similar course. The case of America is peculiar. There the foundation of the state structure was to be laid on a clear site, and the first page of the history to be written. Those who came together to form the new community were personally perfectly free and equal, and the local circumstances were such as to favor the exercise of this liberty and equality, by rendering any very great disparity in material means impossible. In such circumstances, the construction of a perfectly democratic order of society could be carried out without struggle, and without any dangerous straining of the principle. There no one looks upon the restriction of the franchise to residents—which is the law in most states of the union—as an infringement of the democratic principle. Norway bears no little resemblance to America; in that country, the democratic element was never so completely crushed as in other parts of the continent, and that form of society is favored by the means and style of living, which are extremely simple, and are based on a nearly equal division of the soil.

In the development of democracy in modern times, circumstances have directed its attacks rather against the aristocratic, than against the monarchical principle. At one time, monarchy, in its struggle with the aristocracy, found its natural allies in the democracy. The princes, in striving to break the power of the great nobles, which limited their own, often called in the help of the democratic element, partly by conferring privileges on bodies of the people, such as city corporations, and partly by attaching individuals of the non-privileged classes to their personal service, and appointing them to influential positions in the state. The road to power and distinction was, it is true, already open to individuals of the democracy through the church, whose dignities and privileges were not confined to the noble by birth, but were accessible to personal capacity. At a later period, the universities, especially in the faculty of law, formed for the democracy stepping-stones to power, from which they sometimes overtopped the aristocracy of birth. And when the princes—at their head the Louis of France—aiming at absolute authority, sought to find a counterpoise to the feudal nobility, by creating a bureaucratic state machinery, and favoring intelligence in every form, the very widest path was opened to the democratic element for attaining influence and distinction. It is true that all this

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was at the cost of its most essential principle; for the equality created by a leveling absolutism, raising the low and depressing the high, was nothing more than an equality of dependence upon the one absolute master of all.

The relation between democracy and monarchy was different where the ruler came to be limited as the chief officer of the nation. Such a limitation of the power of the monarch, by means of a representative system not confined to the privileged classes, but embracing at least the citizens of towns, was in itself a victory of the democratic principle. As the circle of this popular representation widens, and its influence in the state increases, such a monarchy becomes more and more democratic in all its institutions.

In a purely democratical state, the people may exercise their power in either of two ways—directly, or through delegates: in the one case, the democracy is said to be absolute; in the other, representative. The absolute or direct form prevailed in the republics of antiquity; political representation, in fact, seems to be a modern idea. The same is the case with the original Swiss cantons, where almost all public business is discussed in a full assembly of the people. In Switzerland generally, the representative form is now preferred. It is also carried out in the states of North America, and was adopted in the French republic of 1848. The absolute form, in fact, is only adapted for small communities with a population concentrated as to space, and differing little in mode of life or culture. According to some, the representative system is inconsistent with the principle of democracy, as the will of the people is liable to be falsified and crossed by the very organs that are to carry it into execution. It is rather an advantage, however, that the first impulse of the public will, sometimes passionate and short-sighted, should be tempered and enlightened, by passing through a series of media on its way to action; and the hold which the constituency have upon their representatives, by means of frequent re-election, and in other ways, is sufficient guard against any defeat of a steady, earnest, public conviction.

M. de Tocqueville and Mr. J. S. Mill applied themselves to setting forth the evils and dangers of democracy, which they—the latter especially—both regarded not only as a system that must inevitably extend itself, but as the ideally perfect form of government. Mr. Mill was at great pains to show that self-government by a representative democracy is what develops, in the greatest degree, the good mental qualities, both intellectual and moral, of the governed, and that it is desirable gradually to extend this participation in the acts of government till it include the entire adult population, male and female. On the other hand, there are two sources of evil to which we are liable, more or less, as democracy approaches to the term of universal suffrage, and which are to be provided against by proper constitutional arrangements. The first of these is the insufficient mental qualifications of the governing body for the highly complicated work of government. Public administration is a profession, like engineering, medicine, or the law, and demands, no less than these, a special training and devotion of mind. In monarchies and aristocracies, the management of affairs is in the hands of a few, who make it the business of their life, and acquire the requisite skill for doing the work well. In a democracy, this advantage is lost, except in so far as the details of administration are left to skilled officials; the public assembly merely retaining the power of checking and controlling those officials, and of determining general rules of policy.

The other danger is the predominance of the laboring class, by virtue of their numbers, over the class made up of employers of labor, and the rich and educated generally. When there are two or more classes in the community with conflicting interests, the desirable arrangement is, that their power should be equally balanced, so that no party could carry a point by political position alone, or without appealing to the reason, and sense of justice, of some members of the other parties. But if the suffrage were universal, the laboring-class interest would be the predominant one; and so serious would be the danger of class legislation as a result, that Mr. Mill thought it necessary to provide a remedy in the shape of granting a plurality of votes to certain persons, especially those distinguished by education, so as to restore the balance.—*Considerations on Representative Government*, chap. viii.

The most comprehensive and most widely accepted definition of this term as used in the United States is embodied in the striking words of Abraham Lincoln: "A government of the people, by the people, for the people." This definition is fluctuating on account of the uncertain meaning of the word "people," which is generally used in a more or less restricted sense. Strictly speaking, it might be held to include every person in the jurisdiction, without distinction of age, sex, or class; but as a political term it is usually taken to mean only the great body of adult male citizens. In the days of slavery, by a mental reservation, negroes were generally excepted. Women and children, as well as idiots and criminals, are also excluded; but it is now insisted by a strong and growing party that the exclusion of women cannot be reconciled with the rational and consistent interpretation of the word democracy. The rights of this class are already so far recognized in some of the states that they are allowed to participate in the election of school officers, and to serve on school committees and boards of charity. The tendency of the times is undoubtedly towards a broader interpretation of the democratic idea, though the movement in this direction meets with a stubborn resistance. The government of the United States is called democratic, as also are the governments of the states composing the union; but they are only comparatively, not purely such. See SUFFRAGE.

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DEMOCRATIC PARTY. The term "Democrat" was used in American politics as early as 1789, to designate those who desired to hold to the exact letter of the Constitution; and was then synonymous with "Republican" and "Anti-Federalist." The first success of the Democrats as a party was the election of Thomas Jefferson President in 1801. Mr. Jefferson preferred the title of Republican, but it was gradually dropped, as was also Anti-Federalist, while Democrat was retained. This party remained in power with two short interruptions until 1860, when it was defeated by the stand it took on the question of slavery. It has been one of the two great parties throughout the century, however, fiercely contesting every election, and successful in electing its candidates in 1884 and 1892. It attained its greatest prestige during the administration of Jackson, by its opposition to the tariff, nullification, and the re-chartering of the U. S. Bank. Other important measures during its supremacy were the Missouri Compromise, the annexation of Texas, the Mexican war, and the so-called Wilmot Proviso. See REPUBLICAN; UNITED STATES.

DEMOCRITUS, an illustrious Greek philosopher, was b. at Abdera, in Thrace, about 470 or 460 B.C. Of his life, little is known. The statement that he was first inspired with a desire for philosophic knowledge by certain Magi and Chaldeans whom Xerxes had left at Abdera, on his Grecian expedition, is as untrustworthy as that which represents him as continually laughing at the follies of mankind. His extensive travels, however, through a great portion of the east, prove the reality of this desire, as does also his ceaseless industry in collecting the works of other philosophers. D. was by far the most learned thinker of his age. He had also a high reputation for moral worth. He appears to have left a strong impression of his disinterestedness, modesty, and simplicity on the mind of the community, for even Timon the scoffer, who spared no one else, praised him. The period of his death is uncertain. He lived, however, to a great age. Only a few fragments of his numerous physical, mathematical, ethical, and musical works are extant. These have been collected by Mullach (Berlin, 1843). Cicero praises his style, and Pyrrhon imitated it.

D.'s system of philosophy is known as the *atomic system*. Its essence consists in the attempt to explain the different phenomena of nature—not like the earlier Ionic philosophers, by maintaining that the original characteristics of matter were *qualitative*, but that they were *quantitative*. He assumes, therefore, as the ultimate elementary ground of nature, an infinite multitude of indivisible corporeal particles, *atoms* (see ATOM), and attributes to these a primary motion derived from no higher principle. This motion brings the atoms into contact with each other, and from the multitudinous combinations that they form, springs that vast and varying aggregate called *nature*, which is presented to our eyes. D. did not acknowledge the presence of *design* in nature, but he admitted that of *law*. "The word *chance*," he says, "is only an expression of human ignorance." He believed strictly in secondary or physical causes, but not in a primary immaterial cause. Life, consciousness, thought, were, according to him, derived from the finest atoms; those images of the sensuous phenomena surrounding us, which we call mental representations, were, according to him, only material impressions, caused by the more delicate atoms streaming through the pores of our organs. D. boldly applied his theory to the gods themselves, whom he affirmed to be aggregates of atoms, only mightier and more powerful than men. Strange to say, the ethical system of D.—in spite of the grossness of his metaphysics—is both pure and noble. Such fragments of his writings as we possess contain beautiful, vigorous, and true thoughts concerning veracity, justice, law, order, the duties of rulers, etc.

DEMOD'OCUS, a famous singer, who is represented by Homer, as celebrating at the banquet of Alcinous the Greek heroes of the Trojan war. He also sang the loves of Venus and Mars.

DEMOGORGON, a mysterious and terrible being, referred to by the classical and mediæval writers, and in later poetry. He is to be the conqueror of Jupiter, and the ancients avoided even the mention of his name.

DEMOGRAPHY. A name that has recently come into use as a synonym for SOCIAL SCIENCE (q.v.).

DEMOISELLE, *Anthropoides*, a genus of birds of the family *gruidæ* (cranes), differing from the true cranes in having the head and neck quite feathered, and the *tertials* of the wings elongated and hanging over the tail, so as in some species to reach the ground. The D., or NUMIDIAN D. (*A. virgo*), is about 3 ft. in length.

DEMOIVRE, ABRAHAM, a distinguished mathematician, was b. at Vitri, in Champagne, 1667, and died at London in 1754. Of French extraction, he spent most of his life in England, whether he fled, with many others, for shelter in 1685, on the revocation of the edict of Nantes. He long supported himself by private tuition and public lecturing, and, towards the end of his life, by answering questions in chances, play, and annuities, most of his responses, it is said, being given at a coffee-house in St. Martin's lane, where he passed much of his time. The appearance of Newton's *Principia* incited him to increased devotion to mathematical studies, to which he had always been disposed, and at last he ranked among the leading mathematicians of his time. He was a member of the royal societies of London, Berlin, and Paris. The *Philosophical Transactions* of London are enriched by many contributions from his pen; and he was so esteemed by the royal society, that they judged him a fit person to decide the famous

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contest between Newton and Leibnitz for the merit of the invention of fluxions. Among his published works are *Miscellanea Analytica de Seriebus et Quadratis*, etc. (1730, 4to); a work on *The Doctrine of Chances* (1718 and 1738), dedicated to sir Isaac Newton; and another on *Life Annuities* (3d edit., 1750). D.'s name is well known from its association with a useful trigonometrical formula—viz., that whatever be the index n, $\cos n\theta + \sqrt{-1} \sin n\theta$ is a value of $(\cos \theta + \sqrt{-1} \sin \theta)^n$.

DEMOLITION, in military operations, is one of the destructive parts of the duty intrusted to the engineers. When works and buildings belonging to the enemy are to be destroyed, to facilitate operations on the one side, or to obstruct on the other, rules are laid down by which the demolition may be most easily and quickly effected. The quantity of gunpowder to be blasted for bringing down masonry of a particular thickness, the determination of the line of least resistance—these and similar matters are required to be studied by officers of the engineer corps.

DEMONETIZATION. See BIMETALLISM.

DEMONIACS (*dæmoniaci, obsessi*, or, with reference to the supposed influence of the moon, *lunatici*), the name given by the Jews to persons afflicted with epilepsy, hypochondria, or insanity, diseases of frequent occurrence in the east. The name originated in the belief, that persons so afflicted had been taken possession of by evil spirits or demons (q.v.). It was a prevalent opinion among the Persians, Greeks, Romans, and the ancients generally, that the extraordinary conditions and actions of men, which could not be referred to the known and apparent operations and powers of the mind, must be ascribed to the influence of one or more higher spirits. This belief is found in Homer, Herodotus, Euripides, and later writers, and also rooted itself very deeply in the Christian mind during the middle ages. As the *good*, when beyond the limits of the ordinary powers or faculties of great men, was attributed to the inspiration of the Muses, or to the direct co-operation, or even incarnation in their persons of some beneficent deity, so also that deep internal unhappiness of "a mind diseased," which no strength of will, and no physician's art in olden times could remove, was as unhesitatingly attributed to evil spirits, or *demons*, as the later Jews, probably with an oblique reference to paganism, called them. Spells and exorcisms, in consequence, took the place of the healing art in reference to such as were supposed to be demonized, and the Jewish exorcists (demon-banishers) alleged, according to Josephus, that they possessed the necessary magic formulas, wonder-working roots, etc., which had been handed down from antiquity. The good spirits thus appeared—in harmony with the idea that healing was a thing natural and divine in itself, the normal action, so to speak, of nature—to fulfill their function in banishing and destroying the demons. Thus, Christ appears in the synoptic gospels as healing many who were possessed of unclean spirits, casting out devils, etc. But apart from the fact, that a belief in demoniacal possession was more vital and universal among the later Jews than among the other nations, on account of their being more deeply penetrated by the consciousness of sin, and by a conviction of the mysterious connection between evil and Satan, it was also expected of the Messiah, the anointed of God, that he would possess "power" over demons. This fundamental national belief would unconsciously prepare the contemporaries of Christ for regarding his divine exercise of the physician's art from a *religious* rather than a *scientific* point of view. When they beheld the miraculous effects of his "power" on the bodies and spirits of the so-called demoniacs, it was natural that they should speak of it in language intelligible to their age, and in harmony with its general notions. To have used other words from the stand-point of a higher scientific knowledge, would have been as confusing to the Jews and earliest Christians as it would have been to assure them that it was the *earth*, and not the *sun*, which stood still during the battle at Gibeon. Besides, when it is remembered that before even the synoptic gospels were written, the miraculous incidents in Christ's life must have fixed themselves in the memory of the populace, under the conditions of the popular belief, it is difficult to see that there was any other course open to the evangelical historians, even if they did not share the common belief of their coutrymen, than to adopt the current representations. They had no interest in the mere scientific accuracy or inaccuracy of such representations. Their object was different and higher: it was to show the power, wisdom, and goodness of the Saviour, qualities which are equally manifest whichever theory may be adopted. This view of the question, which is held to be in conformity with sound science and sound criticism, presents itself almost irresistibly to the candid and impartial student of the Bible, when he bears in mind that there is nothing in the recorded examples of demoniacal possession different from the ordinary symptoms of epilepsy, hypochondria, and insanity, which are not *now* beyond the physician's skill.

DE'MONS (Gr. *daimŏnes*, Lat. *genii*) are, according to superstitious belief, spirits which exercise an influence on the fortunes of men. Their dignity and character have both changed greatly in the course of time. Homer calls the *gods* demons, and *daimoniakos* is with him equivalent to *divine*. Hesiod affirms that there are in the air 30,000 D. or ministering spirits, who were the souls of men in the golden age; but a proper classification of these is first found in the Pythagorean and Neo-Platonic systems. Aristotle

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separates the immortals into gods and D.; mortals, into heroes and men. Plato, from whom Aristotle probably received the hint of his division, says in his *Symposium* that "the demon is a middle intelligence between God and man, and the uniting link which completes the chain of being." In other places, he informs us that they inhabit the air, wander through the sky, hover over the stars, and tarry on the earth. They also see the hidden issues of the future, and can alter them at their pleasure. Every mortal receives at his birth a particular demon, who accompanies him to the end of his life, and bears his soul to the place of purification and punishment. In general, it may be said that the Greeks included the divinity or Deity among the D., in so far as he arranged and disposed the dissimilar fortunes of men. In reference to the actions ascribed to them, the D. were divided into *good* and *bad*—*agathodaimones* and *kakodaimones*. These evil D. were not, however, originally supposed to be hostile to the divinity or supreme demon. They came from him, and carried out his purpose as truly as the good demons. This was precisely the belief of the earlier Jews also, as we find, for example, from the history of Saul, into whom God repeatedly sent an "evil spirit," i.e., a demon, in the classical and not in the mediæval sense of the term. The demonism of the Romans consisted chiefly in the worship of departed spirits. See LARES, MANES, and PENATES. The origin of the doctrine of D. is to be sought for in the east. In the teaching of the Hindus, who, besides the highest Deity, Brahma, recognize a countless number of divine agents or messengers, the D. are called *deitjas*. In Parseeism, or the religion of Zoroaster, however, this doctrine is found in its most systematic and elaborate development. Indeed, the Persians and Jews *alone* among the nations of the old world had the conception of evil spirits headed by a chief demon, a Satan, who was over them as a god. To the genii or D. in the kingdom of Ormuzd (light), who are called *Izeds*, stand opposed the genii in the kingdom of Ahriman (darkness), who are called Dews. According to the belief of the Egyptians, the circuit of the world (the sea, the earth, the air) was filled with D., who ruled the elements, exercised mysterious influence over stones, metals, and plants, and had the souls of men in their power. Although demonism came to Greece from various countries, and by various channels, yet the principal source of it was Egypt. The Jews derived theirs—at least to a great extent—directly from the Persians, during the time of the Babylonish captivity; and although acquainted with "angels" from an early period, angelology, beyond all question, first received elaborate treatment after the return from exile. The dualism which characterizes the system of Zoroaster now made itself conspicuous here. According to the Jewish demonology, there were seven good D. who formed the council of Jehovah, and ever stood before his throne, while the evil D. have at their head Satan or Asmodi. After the Jews had, under the Seleucidæ and Ptolemies, entered into extensive commercial relations with the Egyptians and Greeks, especially in Alexandria, Græco-Egyptian conceptions were associated with those derived from Persia. When Christ made his appearance in the world, the Jewish conception of a demon as an "evil spirit," *not* from God, had become definitely fixed and popular. This narrowing of the application of the word may have partly originated in the wish to glorify Judaism at the expense of paganism. It would gratify the national pride, which was strongest when it had least to boast of, to include the *D.*, i.e., the spirits both good and bad, of all the surrounding Greek-speaking nations, in one black category, and so make them stand as the representatives of evil. The early Christian writers carried out this tendency to perfection; for instead of denying the existence of the heathen gods, they turned them into D., who, acting under the inspiration of their wicked master, had cheated the souls of men, and so made them also worship Satan unawares. See DEVIL. The doctrine of the early church concerning the fall of the D., based on Genesis vi. 2, and concerning their activity, is a mixture of Jewish and Platonic notions, Christianized, however, by the belief that all their action is controlled and directed by God. Among the Germanic races, during the middle ages, the idea of a person's being taken possession of by D., led to the other idea of a covenant with the devil, of which the legend of Faust is a well-known example. See Ukert, *Ueber Dämonen Heroen und Genien* (Leip. 1850); and Conway's *Demonology and Devil Lore* (1878).

DEMONSTRATION (Lat. *demonstrare*, to point out, to cause to see), in mathematics, is a proof of any proposition which excludes doubt; such are the demonstrations of the propositions in Euclid's *Elements*. The method of demonstration in mathematics is the same with that of drawing conclusions from principles in logic, and is usually syllogistic, the premises being omitted to be stated at each turn. The principle of *reductio ad absurdum* is also employed. See REASONING, SYLLOGISM.

DEMONSTRATION, in military operations, is an apparent movement or maneuver, the chief object of which is to deceive the enemy, and induce him to divide his force, as if to meet dangers from various quarters. When thus divided and weakened, he may be attacked with greater chance of success.

DEMONTÉ, a t. in the s.w. of Piedmont, northern Italy, situated on the Stura, 15 m. s.w. of Cuneo. Pop. about 7000.

DE MORGAN, AUGUSTUS, was b. in 1806, in the small Indian island of Madura, on the n.e. coast of Java. His father was an officer in the British army. He was educated

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at Trinity college, Cambridge, and took his degree of B.A. in 1827, when he was fourth wrangler. He was appointed first professor of mathematics in the University college, London, after its foundation in 1828. In 1831, he resigned this office, but was reappointed in 1836, and continued in that capacity till his death. His writings are very numerous. Besides being a mathematician of the first order, he was extensively and minutely versed in the history of the mathematical and physical sciences. He also devoted himself to the development of the Aristotelian or "formal" logic, to which he has given so symbolical a shape as to make it seem like a branch of algebra. He has written likewise on the calculation of insurances and on the decimal coinage. The following are the titles of a few of his works: *Elements of Arithmetic* (1830); *Elements of Algebra, preliminary to the Differential Calculus* (1835); *Elements of Trigonometry and Trigonometrical Analysis, preliminary to the Differential Calculus* (1837); *Essay on Probabilities, and on their Application to Life Contingencies and Insurance Offices* (1838); *Formal Logic, or the Calculus of Inference necessary and probable* (1847); *Arithmetical Books, from the Invention of Printing to the Present Time, being brief notices of a large number of works drawn up from actual inspection* (1847). De M. is also the author of the treatises on the differential and integral calculus, published by the society for the diffusion of useful knowledge; and contributed largely to the *Penny Cyclopædia*. He died Mar., 1871.

DEMOS, a name applied first to the 100, and afterwards to the 174 districts into which Attica was divided. They had each their own officers, assemblies, and religious usages.

DEMOSTHENES, the greatest orator of Greece, and indeed of the ancient world, was a native of Athens. The date of his birth is doubtful. Fynes Clinton assigns it to the year 382 B.C.; Thirlwall and other good authorities, to the year 385 B.C. His father, a wealthy manufacturerer, died early, leaving his fortune and children to the care of three guardians, who cruelly abused their trust. As soon as D. came of age, he resolved to prosecute at law these unfaithful stewards. He gained his case, but much of the property had been already squandered, and he only recovered enough to save him from poverty. His success in this and some other civil causes fixed his resolution to devote himself to public life; and he set himself to master the law and politics of his country with a labor and perseverance almost without a parallel. His first care was to conquer the physical disadvantages under which he labored. His health was naturally feeble, his voice harsh and tuneless, and his action ungraceful. To strengthen his lungs, he used to climb steep hills, reciting as he went, or declaim on the shores of the sea in stormy weather. To improve his delivery, he took instructions from Satyrus the actor, and did not even disdain to study effects before a mirror. His feebleness of health he never fairly overcame, but he obviated the defects of his early training by the severest study pursued for months at a time without an interruption.

D. first began to take part in public affairs in the 106th Olympiad, when he was between 27 and 30 years of age, and from that time till his death, his history is the history of Athens. The states of Greece were at this time miserably weak and divided, and had recklessly shut their eyes to the dangerous encroachments which Philip of Macedon was even now making on their common liberties. The first period of D.'s public life (extending over ten years from 356 B.C.) was spent in warning his countrymen to abate their mutual jealousies, and unite their forces against the common enemy, whose crafty and grasping policy he exposed so nobly in 352 B.C. in the oration known as the First Philippic. Three years later, Philip became master of Olynthus, the last outpost of Athenian power in the north, which, in a series of splendid harangues—the three Olynthiacs—D. had implored his countrymen to defend. Peace was now necessary for Athens; and D. was among the ambassadors sent to negotiate with the conqueror; but Macedonian gold had done its work, and D., as incorruptible as he was eloquent, saw with despair that Philip was allowed to seize Thermopylæ, the key of Greece, and become a member of the Amphictyonic league. The peace lasted for six years, during which Philip's incessant intrigues were exposed and denounced by D. in orations hardly less remarkable for their political wisdom than for their matchless eloquence. The most important of these were the second, third, and fourth Philippics; and the speeches on the "Misconducted Embassy," and "The Affairs of the Chersonese." When war broke out in 340 B.C., D. introduced several important reforms into the army and navy, and showed such powers of vigorous administration, that Philip was baffled for a time. The struggle was closed in 338 B.C. by the battle of Chæroneia, which laid Greece prostrate at the feet of the Macedonians. Only once after that event did D. appear on the scene of his previous triumphs. But on that occasion he delivered, in defense of his friend Ctesiphon, his oration "For the Crown," which the almost unanimous verdict of critics has pronounced to be the most perfect masterpiece of oratory that ancient or modern times have seen. Æschines, his life-long enemy, against whom this speech was delivered, was so overwhelmed by it, that he quitted Athens, and spent the remainder of his life in exile. In 324 B.C., D. was accused of taking part in a revolt against the Macedonian domination, and thrown into prison, whence he escaped, and fled into exile. The death of Alexander the great in the following year brought a gleam of hope and sunshine to the Athenians; and D., recalled from exile, was again at the head of affairs. Once more the power of Macedon prevailed. D. was demanded up by the conquerors.

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Finding escape impossible, the hunted orator sought an asylum in the temple of Neptune, in the island of Calaurea. Before his pursuers overtook him, he had died, as was generally believed, of poison administered by his own hand. His death took place in 322 B.C.

The personal character of D. is one which it is scarcely possible either to praise or to admire too much. His dauntless bravery, the stainless purity of his public and private life, his splendid and disinterested patriotism, and his services as a statesman and administrator, entitle him to a place among the highest and noblest men of antiquity. On his merits as an orator, it is hardly necessary to dwell. Suffice it to say, that the intelligent of all ages subsequent to his own have, with scarcely a dissentient voice, assigned to him the highest place. Homer is not more clearly the prince of ancient poets, than is D. the prince of ancient orators.—The best of the earlier editions of D. are those of Bekker and Reiske, both now superseded by the edition of Westermann (1890). His principal orations are translated into English by Leland, and the whole by Kennedy, in 5 vols., for Bohn's Classical Library (1863).

DEMOS'THENES, a conspicuous Athenian gen. in the Peloponnesian war. He was one of the commanders sent, 413 B.C., to reinforce Nicias at Syracuse; but he was captured and put to death.

DEMO'TIC ALPHABET. See HIEROGLYPHICS.

DEMO'TICA, a t. of European Turkey, in the province of Roumelia, 22 m. S. of Adrianople. It is situated on the Maritza, here navigable for small vessels, and is defended by a citadel. It contains an old palace, is the seat of a Greek archbishop, and has manufactures of textiles, etc. Pop. 10,000. Charles XII. of Sweden, who, after the battle of Pultowa, first found a refuge at Bender, afterwards removed to D., where he remained for some time.

DEMPSTER, JOHN, D.D., 1794–1863; a Methodist clergyman, a native of New York. When young he was a peddler. At the age of 18 he was converted, and in 1816 he was admitted to the general conference, preaching in various places in New York and Canada. In 1835 he was a missionary to Buenos Ayres. In 1842 he had charge of a church in New York. In 1847 he founded the biblical institute which now constitutes the school of theology of Boston university. In 1856 he established a similar institution at Evanston, Ill. His *Lectures and Addresses* have been published.

DEMPSTER, THOMAS, a professor famous for his learning, and a miscellaneous and voluminous writer, was born at Cliftbog, in Aberdeenshire, about the year 1579. What the rank or condition of his family was, is unknown; we know, however, that he studied at Cambridge, and that when he went to France, which he did while yet young, in order to perfect his education, he represented himself as a man of family, and as the possessor of an estate. At Paris, he obtained a professorship in the college of Beauvais, where he manifested a very quarrelsome temper, engaging, it is said, almost daily in some brawl. One of these unseemly disturbances resulted in D.'s having to retreat to England. To France, however, he again returned, bringing with him a wife, whom he had married while in England, and who was very beautiful. Crossing the Alps, he obtained a second professorship at Pisa, drawing a handsome salary for his labors. Here, however, the infidelities of his wife marred his peace; and he removed to Bologna, where he became professor of *belles-lettres*, and where his wife completed her shame by eloping with "one or more" of his students. Poor D. seems to have been fond of this wanton, for he took the trouble of attempting the capture of the fugitives. He failed; and died at Butri, near Bologna, 6th Sept., 1625.

D. is the author of numerous treatises, among which may be mentioned the *Historia Ecclesiastica Gentis Scotorum*—a work in which his desire to magnify the merits of his country often induced him to forge the names of persons and books that never existed, and to unscrupulously claim as Scotchmen, writers whose birthplace was doubtful, or who were known to be natives of England, Wales, Ireland, and even France and Germany; but nevertheless, in spite of its defects, it is justly reckoned a valuable and erudite peformance. It was reprinted for the Bannatyne club in 1829.

DEMULCENTS (Lat. *demulceo*, I soften), bland and lubricating liquid substances, taken by the mouth, for the purpose of soothing irritation of the mucous membranes, and promoting the dilution of the blood, and the increase of the secretions. D. are chiefly composed of starch (q.v.), or gum (q.v.), or of substances containing these, dissolved in water; sometimes also of oily matters, or the white of eggs, and other albuminous or gelatinous substances largely diluted. The decoction of althæa, or narsh-mallow, is a favorite form of demulcent.

DEMURRAGE, in the law-merchant, is an allowance made to the master or owners of a ship, by the freighter, when she is detained in port by the latter beyond the specified time of sailing, for his own convenience. A certain number of days, called running or working days, are allowed for receiving and discharging cargo, and it is usually stipulated in charter-parties that the freighter may detain the vessel, either for a specified time, or as long as he pleases, on paying so much *per diem* for over-time. All the ordinary causes of detention, such as port-regulations, the crowded state of the harbor, and the like, are at the risk of the freighter, and D. must be paid, though it be

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proved that the delay was inevitable by him (*Commentaries*, V. i. 431, Shaw's ed.). "In short," says Mr. Bell, "the rule is, that during the loading or unloading of the ship, the merchant runs all the risk of interruptions from necessary or accidental causes; while the ship-owners have the risk of all interruptions from the moment the loading or unloading is completed." But D. is not due where the delay arose from detention of the ship by a public enemy, or from hostile occupation of the port; and it cannot, of course, be claimed where the fault lay with the owners themselves, or the master, or crew of the vessel. The D. ceases as soon as the vessel is cleared for sailing, though she should be prevented from actually doing so by adverse winds. When the days of D. are limited by special contract, and the ship is detained beyond them, the sum due as D. under the contract will be taken as the measure of the loss for the further time which may be claimed in the form of damages. It will be open, however, to both parties to show, that the rate thus fixed *per diem* is either too high or too low. Where there is no stipulation beyond the ordinary agreement that the usual time shall be allowed for loading and unloading, the master will be entitled, when this period expires, either to sail or to claim damage for detention.

DEMURRER, in English law, is an exception by one party in a suit or action to the sufficiency in point of law of the case of the opposite party. *At common law*, each party might demur to the sufficiency of the pleading of the opposite party. The party whose pleading was demurred to might either amend or put in a joinder in demurrer. *A demurrer in equity*, like a D. in law, admitted the facts of the case, but stated objections to the form of the bill in equity (q.v.), or the sufficiency of the plaintiff's case to sustain the remedy craved. Since the judicature act of 1875, a D. is argued before a divisional court if in the queen's bench, common pleas, or exchequer division of the high court; before a single judge, if in the chancery division, or in the probate, divorce, and admiralty division.

In American law a demurrer is a form of pleading by which it is set up in substance that even though the facts alleged by the opposite party in a preceding pleading be true, yet they are not sufficient in law to sustain the action. This form of pleading is used in both common law and equity practice and also under most code procedures. A demurrer may be put forward at any stage in the pleadings when the opposing party sets up a claim which it is desired to attack as insufficient in law. A *general* demurrer disputes the legal sufficiency of the previous pleading only in general terms; a *special* demurrer alleges specific defects. Under the old common law pleadings it was held that a demurrer admitted all the facts properly presented in the previous pleading, but the present practice is generally to reserve the law points without admitting the facts. As a demurrer raises only issues of law, argument upon it is directed to the court alone, not to the jury. The use of demurrer in criminal proceedings is almost or quite obsolete, as the accused person can with better advantage take exception to law points, and, if necessary, move for a new trial on them as a basis. The proper answer to a demurrer may be either an amendment of the pleading demurred to or a *joinder in demurrer*, which brings the law question into proper form for argument and decision.

DEMY (from Lat., *dimidius*, half), i.e., *half*-fellow, the name borne by the scholars of Magdalen College, Oxford. These scholars succeed in order to vacant fellowships. The name demy would seem to have arisen out of *demi-socii* (half-fellows), the Latin designation of these scholars. There are eight senior demyships, valued at £100 per year, and thirty junior, of the annual value of £50.

DEMY', a particular size of paper. In that of printing-paper, each sheet measures 21 inches by 16; drawing-paper, 22 by 17; and writing-paper, 22 by 15½.

DENAIN, a t. of France, in the department of Nord, on the left bank of the Scheldt, about 5 m. w. of Valenciennes. Its situation, in the center of an extensive coal-field, and in the immediate vicinity of iron mines, gives it unusual facilities for smelting iron, and its works of this kind are of considerable importance. D. is a regular and well-built town, and has a good market. It has some manufactures of beet-root sugar. Pop. '91, 16,663.

DENA'RIUS (*deni*, ten each), the principal silver coin among the Romans, was equal to ten *ases*, but upon the reduction of the *as*, the D. equaled sixteen of it. It was first coined 269 B.C. Its weight at the end of the Roman commonwealth is estimated at 60 grains, while under the empire the weight was 52.5 grains of silver. The value of the commonwealth D. was thus rather more than 17*c.*, and of the later period about 15*c.*

DEN'ARY SCALE. See NOTATION.

DENBIGH, a parliamentary and municipal borough, the county town of Denbighshire, in the n. of the county, 30 m. w. of Chester, and 213 m. n.w. of London. It stands in the hundred of Isaled, near the middle of the vale of the Clwyd, on the sides and at the bottom of a rugged steep limestone hill, crowned by the imposing ruins of a castle built in 1284, by Henry Lacy, earl of Lincoln, where there had stood fortifications erected by William the Conqueror, and where there are traces of still earlier castellated remains. The newer part of D. was built at the bottom of the hill, after the destruction and desertion of a great part of the town on the top of the hill, about 1550. D. has manufactures of shoes and leather for the English markets and export trade; but it is

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more a place of residence than of commerce. Pop. in 1891, 6412. It sends one member to parliament, Ruthin, Holt, and Wrexham being contributory boroughs. In 1645, Charles I. took refuge in the castle after the battle of Rowton Heath. The garrison surrendered to the parliamentary forces, after a siege of two months. It was shortly afterwards dismantled. The fortifications have an area of a sq. m. in extent. A lunatic asylum for the five counties of North Wales was erected near the town in 1848. It also contains a Blue-coat school and an asylum for orphan girls. The charter of Henry de Lacy is preserved among the corporate archives.

DENBIGHSHIRE, a co. of North Wales, on the Irish sea, and between the Dee and the Conway. It is 41 m. long, with an average breadth of 17; contains 663 sq. m.; has 8 m. of coast, and is the sixth in size of the Welsh counties. The surface is partly rugged and mountainous, with some beautiful and fertile vales, as the vale of the Clwyd, 20 m. by 7. In the n. is a horse-shoe range of hills, 65 m. long, and convex to the coast. The highest hill is Cader Fromwen, 2,563 ft.: and many others rise above 1500 feet. The rocks are chiefly Silurian clay and graywacke slates, with some granite and trap, and bands of Devonian, carboniferous, and permian strata. There occur coal, iron, slates, flags, millstones, limestone, lead, and copper. The chief rivers are the Dee, Conway, Elwy, and Clwyd. The Rhaiadr waterfall is 200 ft. high in two parts. Llangollen vale is famed for romantic beauty and verdure, amid hills of savage grandeur. The climate is mild in the lower parts, but cold and bleak among the hills, where small hardy sheep and ponies are reared. About two-thirds of D. are under cultivation; its corn, cheese, butter, and live-stock are greatly esteemed. It is also well timbered. Salmon are caught in the rivers. The chief towns are Denbigh, Wrexham, Ruthin, Holt, Llangollen, Llanrwst, Abergele, and Ruabon. Pop. 91, 118,843, showing an increase of 74 per cent. since the first census in 1801. D. returns three members to parliament—two for the county and one for the boroughs of Denbigh, Holt, Ruthin, and Wrexham. D. was anciently occupied by the Ordovices, a powerful tribe, not entirely subdued by the Romans till the time of Agricola. Of British or pre-Roman remains there still exist tumuli, two cistvaens or stone cells, barrows, and forts. To the times of the Welsh and Saxon struggles are referable the Pillar of Eliseg, near Llangollen, and the dikes of Offa and Watt. Offa's, the king of Mercia's, dike to keep out the Welsh, was a ditch, with small forts on mounds at intervals, and ran from Herefordshire to the estuary of the Dee; Watt's dike ran on the e. side of Offa's dike and parallel to it. Wrexham church is one of the seven wonders of Wales. Chirk castle is a fine Norman stronghold, lately restored.

DENDERAH (Greek *Tentyra*, Coptic *Tentore*, probably from *Tei-n-Athor*, the abode of Athor), a ruined t. of Upper Egypt, situated near the left bank of the Nile, in lat. 26° 13′ n., long. 32° 40′ east. It is celebrated on account of its temple, dating from the period of Cleopatra and the earlier Roman emperors, and one of the finest and best preserved structures of the kind in Egypt. The principal temple measures 220 ft. in length by about 50 in breadth, and has a noble portico supported on 24 columns. The walls, columns, etc., are covered with figures and hieroglyphics. Prominent among the former is that of Athor or Aphrodite, to whom the temple was dedicated. On the ceiling of the portico are numerous mythological figures arranged in zodiacal fashion, and which were long regarded as a representation of the zodiac; but the absence of the crab has led some recent archæological travelers to doubt whether the figures were intended to have any reference to astronomy. A Greek inscription, which runs around the cornice on the outside of the building, gives the date of the dedication of the portico as the twentieth year of the Emperor Tiberius, but there is evidence that on its site stood an older temple, which is thought to go back to the earliest period of Egyptian history. There are other sacred buildings at D., including a temple of Isis. The whole, with the exception of one propylon, are surrounded by a sun-dried brick wall, 317 yards long, and 306 yards wide.

DENDERMONDE (Belg. *Termonde*), a t. of Belgium, in the province of East Flanders, situated at the confluence of the Dender and the Scheldt, 18 m. e. of Ghent. D., which is said to have originated in the 8th c., is fortified, and has a citadel dating from 1584, and possessing the means of laying the surrounding country under water in case of attack: Louis XIV. besieged it in vain in 1667, but Marlborough, aided by a long drought, succeeded in taking it in 1706. [In connection with Marlborough's siege, D. is mentioned frequently in Sterne's *Tristram Shandy*.] The principal buildings of D. are the town-house and several churches, the most noteworthy of which is the church of Notre Dame, a very old edifice, containing two admired pictures by Vandyk. The manufactures are woolens, lace, cotton-yarn, etc., and there is a large weekly market for the disposal of the agricultural produce of the neighborhood. Pop. '90, about 9600.

DENDRERPETON, a small lizard-like batrachian, found by Lyell and Dawson in the interior of the hollow trunk of an upright *sigillaria* in Nova Scotia. The tree was about two ft. in diameter, and consisted of an external cylinder of coal, and an internal axis of mud and sand, cemented together with fragments of wool into a solid rocky mass. In this were discovered the shell of a *pupa*, the first air-breathing mollusk met with in the coal, and the bones of a small reptile probably 2½ ft. long. It was described and figured by Owen as *D. Acadianum*. He showed it to be nearly related to *arch-*

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egosaurus, from the plicated structure of the teeth, the sculpturing of the broad cranial plates, and the structure and proportion of certain limb-bones. It received its name, "tree-lizard," from its having been found in a tree; and this was supposed to show that it had arboreal habits: it is, however, probable that the remains had been washed in with the mud and sand which form the matrix in which they are preserved.

DENDRITE, the name given to a peculiar branching mineral crystallization on the surfaces of the fissures and joints, or in the substance of rocks, having the appearance of moss, and often mistaken for fossil plants. The hydrous oxide of manganese is the mineral that generally assumes this form, occurring frequently in great abundance in limestone, steatite, trachyte, and other substances.

DENDRO'BIUM, a genus of parasitical orchids almost entirely confined to tropical Asia. The flowers are grotesque in form, but very beautiful, some of which are purple, some a deep yellow, and some green; and all are very fragrant. When artificially raised they require a high temperature.

DEN'DROLITES, petrified stems of trees or shrubs, which occur in all parts of the world in the formations called secondary, especially in the coal formation. They may be regarded as the remains of a former creation. They are of very various magnitude. In some places, gigantic stems are found, and these are often observed to have branches, fruit, and even leaves—these, however, only as impressions—whilst in other places only fragments occur, which, however, belong to trees having nothing in common with those now growing in the same regions—as, for example, beautiful stems of palms at Chemnitz in Saxony, etc. Such woods are generally changed into agate, or into pitchstone, when they occur in ancient strata altered by volcanic fire. Concerning the question of their origin, opinions are still divided. Many of them are so hard and beautifully colored, that they are cut and employed for all artistic purposes. When cut into very thin plates, they exhibit under the microscope the structure of the wood so perfectly, that it is not only possible for botanists to determine the natural order or family of plants to which it belongs, but even the genus and species. They mostly belong to the *filices*, *cycadeæ*, and *coniferæ*. Brongniart was amongst the first investigators of this department of science. He has had many followers, amongst whom, in our own day, Unger and Göppert have especially distinguished themselves. See Göppert *Monographie der fossilen Koniferen* (Leyden, 1850).

DEN'DROPHIS (Gr. tree-snake), a genus of serpents of the family *colubridæ*, remarkable for their extremely slender form, their beautiful colors, and the liveliness of their movements. Their eyes are very large and prominent. They are widely distributed over the warm parts of the world; none are found in Europe. They live chiefly among the branches of trees, and insects are their principal food.

DE NEUVILLE, Alphonse Marie, 1836–85; b. St. Omer, France; d. Paris. He was sent to a military school, afterwards to a law school, but finally, in spite of much opposition, devoted himself to art. His first picture, "The Gervais Battery," took a third medal at the salon, 1859. He earned a place in the front rank of French military painters. "The Last Cartridges at Balan," won for him the cross of the legion of honor, 1873.

DENGUE, or Break-bone Fever, also called Dandy and Bucket Fever, is a disease known in the southern states of North America and in the West Indies, where it was first described as having appeared in the years 1827 and 1828. It was very violent in its access, but not often fatal, and consisted chiefly of a severe attack of inflammatory fever, with great heat and redness of the surface, and well-marked rheumatic pains of the limbs both in the joints and muscles. It usually terminated by a copious perspiration after a few days.

DENHAM, Sir John, an English poet of the reign of Charles I., was the son of the chief baron of exchequer in Ireland, and was b. at Dublin in 1615. In 1631, he entered Trinity college, Cambridge, where, after studying three years, he took his degree. Turning his attention to literature, he wrote a tragedy, entitled *Sophy*, which in 1641 was acted with great applause at Blackfriars. Two years after, he produced the poem *Cooper's Hill*, which has done more to perpetuate his name than any other of his works. In 1647, he was engaged in the performance of secret services for Charles I.; but these being discovered, he was obliged to escape to France in 1648, returning thence to England in 1652. After the restoration, he was appointed surveyor-general of his majesty's buildings, and created knight of the bath. Towards the close of his life, the latter part of which was darkened by an unfortunate marriage, he was visited by insanity; but recovering for a short time, he commemorated the death of Cowley in one of his happiest poetical performances. His own death occurred in 1668. His verse is characterized by considerable smoothness and ingenuity of rhythm, with here and there a passage of some force.

DENI'NA, Carlo Giovanni Maria, an Italian author, was b. 28th Feb., 1731, at Revello, in Piedmont; studied at Turin, and in 1754, was appointed humanity professor at Pignerolo, but was deprived of his office on account of his having written a comedy in which there was much that excited the professional animosity of the ecclesiastical

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order. D. went to Milan, but was soon after recalled to Piedmont, and appointed professor of rhetoric in the university of Turin. In 1777, he published anonymously at Florence his *Discorso sull' Impiego delle Persone*, in which he sought to show how monks might be transformed into useful members of society. This, of course, again cost him his chair, and he was even banished from the metropolis. In 1782, he went to Berlin, on the invitation of Frederick the great. Here he lived for many years, and wrote a considerable number of works. In 1804, he was introduced to Napoleon at Mentz, to whom he dedicated his *Clef des Langues* (Ber. 1804), and was in consequence appointed imperial librarian at Paris, where died 5th Dec., 1813.—D.'s principal productions are: *Discorso sopra le Vicende della Letteratura* (2 vols., Turin, 1761), *Delle Rivoluzioni d'Italia* (3 vols., Turin, 1769–70), an excellent work, which was copiously abused by the apologists of ecclesiastical privileges; and *Storia Politica e Letteraria della Grecia Libera* (4 vols., Turin, 1781–82). D.'s other works were, for the most part, written in Prussia. Among them may be mentioned—*Essai sur la Vie et le Regne de Frédéric II.* (Berlin, 1788), *La Prusse Littéraire sous le Regne de Frédéric II.* (3 vols., Berlin, 1790–91), *Tableau Historique Statisque et Moral des la Haute Italie et des Alpes qui l'entourent* (Turin, 1805), and *Storia dell' Italia Occidentale* (6 vols., Turin, 1809–10).

DENIS, SAINT, according to tradition, the apostle of France and first bishop of Paris, suffered martyrdom in the 3d century. He was sent (as is said) from Rome about 250 A.D. to preach the gospel to the Gauls. After various detentions at Arles and other places, he arrived in Paris, where he made numerous proselytes. Pescennius or Sicinnius Lescennius, who was then the Roman governor of this part of Gaul, ordered D. to be brought before him, along with other two Christians, Rusticus, a priest, and Eleutheros, a deacon. As they continued firm in their faith, in spite of threats, Pescennius caused them to be cruelly tortured, and afterwards beheaded, 272 A.D., or, as others say, 290 A.D. Gregory of Tours, Fortunatus, and the Latin martyrologists, state that the bodies of the three martyrs were thrown into the Seine, but taken up by a pious woman named Catulla, and interred near where they lost their lives. At a later period, a chapel was built over their tomb. In 636, king Dagobert founded on the spot an abbey, called St. Denis, which soon grew to be one of the richest and most important in the whole kingdom, and was long the sepulcher of the French kings. What measure of truth there may be in the above biography, it is impossible to say. The Acts of St. D., written about the end of the 7th or beginning of the 8th c., is founded merely upon vulgar traditions, and is full of absurdities. The Greek church makes St. Denis to be the same person as Dionysius, the Areopagite, first bishop of Athens. The Roman Catholic church celebrates his memory on the 9th of October. For a long time his name was the war-cry of the French soldiers, who charged or rallied to the words *Montjoye St. Denis.*

DENIS, ST., a t. of France in the department of Seine, 6 m. n. of Paris. It is traversed by two small streams, the Croud and Rouillon, and is well built, with clean spacious streets. It is situated within the line of forts forming the outworks of the fortifications of Paris, and was itself formerly fortified, but its ramparts have been converted into promenades. St. D. has manufactures of printed calicoes and other cotton goods; also several flour-mills, dye-works, bleacheries, and chemical works. Its yearly market, at which there is an annual sale of about 180,000 sheep, is one of the oldest in France, and lasts for a fortnight. Pop. '91, 50,992. The town is supposed by some to date from the foundation of a chapel raised above the tomb of St. Denis (q.v.). This chapel was replaced, some time after his death, by a church and abbey, built by Dagobert I., who was buried in the abbey church, which thereafter became the mausoleum of the kings of France. By a decree of the national convention in 1793, the abbey was ordered to be destroyed, and in 3 days 51 tombs were sacrilegiously rifled and demolished, and the bodies cast indiscriminately into ditches prepared for them. The building, stripped of its lead to furnish bullets for the revolutionists, remained roofless, and was used as a cattle-market, until the time of the empire, when Napoleon commenced its restoration, a work which was completed by succeeding governments, in a style surpassing even its former splendor. The crypt of the abbey church contains statues of the French kings and princes from Clovis to Louis XVI.

DENISON, a city in Grayson co., Tex.; on the Houston and Texas Central, the Missouri, Kansas, and Texas, and the Texas and Pacific railroads; 9 miles n. of Sherman. It is an important cattle-shipping point, has large cotton, iron, and machinery interests, and contains national banks, high school, electric light and street railroad plants, waterworks, planing mill, foundry, and daily and weekly newspapers. Pop. 90, 10,958.

DENISON UNIVERSITY, situated at Granville, Licking co., Ohio, was founded in 1831 as a training school, and, not proving successful, was incorporated as a college in 1832, under the name of the Granville Literary and Theological Institution. This name was changed to Granville College in 1845, and to Denison University in 1856. It was founded by the Baptist Education Society, but is not sectarian. Associated with the university is Shepardson College, a school for the higher education of women, the facilities of the university being open to students in the latter institution. The Doane Academy, which is a preparatory school for college, is a part of the educational plant of the university. In 1897 there were 500 students in the university and Shepardson college. Pres. D. B. Purinton.

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DENIZLI', a t. of Anatolia, Asiatic Turkey, situated on a low hill rising out of a spacious plain, in lat. 37° 48′ n., long. 29° 3′ east. D. is chiefly occupied with bazaars and market-places, the inhabitants for the most part residing in the environs. The pop. is estimated at 16,900; it was formerly much more numerous, but by an earthquake in 1715 no less than 12,000 people perished.

DENMAN, THOMAS, Baron, 1779–1854; chief-justice of England; the son of a physician, educated at Cambridge. His success at the bar was rapid, and he speedily rose to rank next to Brougham and Scarlett. His greatest point in advocacy was as counsel for queen Caroline. In this trial he made the king his enemy, and thereby retarded his own promotion. In 1818, he was elected to parliament, and took a seat with the whig opposition. He remained in the commons until his elevation to the bench in 1832. In 1830, he was attorney-general under the Gray administration. Two years later he was made lord chief-justice of the king's bench, and in 1834, was raised to the peerage. He resigned the office of chief-justice in 1850, and retired to private life.

DENMARK (Dan. *Danmark*), capital, Copenhagen, the smallest of the three Scandinavian kingdoms, is situated between 54° and 57° 44′ 50″ n. lat., and 8° 5′ and 12° 45′ e. long., excepting the small island of Bornholm in the Baltic, about 90 m. e. of Seeland, which lies in 15° e. longitude. D. is bounded on the n. by the Skagerak, a gulf of the North sea; on the e. by the Cattegat, the Sound, and the Baltic; on the s. by the states of the German empire; and on the w. by the North sea, which the Danes call the "Western ocean."

The following table gives the main divisions of the kingdom of D. and its principal colonies:

	Area in Eng. sq. miles.	Pop. in 1890.
Denmark proper, comprising the islands of Seeland, Fünen, Laaland, Falster, etc., and the peninsula of Jutland	14,553	2,172,205
The Farõe Islands	514	12,954
Iceland	39,756	70,927
Greenland	46,740	10,516
Danish W. I. islands—viz., Santa Cruz, St. John, and St. Thomas	118	32,786
	101,681	2,299,388

In 1890, the pop. of Copenhagen (Dan. *Kjœbenhavn*), the capital, with suburbs, was 375,251. In 1890 there were 5 towns in D., besides the capital, in which the population exceeded 10,000.

	Population.
Odense, chief town of Fünen	30,277
Aarhuus, in Jutland	33,308
Aalborg "	19,503
Randers "	16,617
Horsens "	17,290

The pop. of the entire country, exclusive of the colonies, in 1897 was estimated at 2,256,000.

The continental portion of D., which since the treaty of Vienna, of Oct. 30, 1864, has been almost wholly limited to Jutland, is, in point of fact, the north-western extremity of the German continent. The entire coast-line of D., along the North sea, Skagerak, Cattegat, Sound, Baltic, and Little Belt, exceeds 800 m.; but many parts of this range are entirely unavailable for purposes of maritime intercourse, in consequence of the shallowness of the water, or of the numberless sand-banks, bars, and small islands which skirt the coasts. Seeland, or *Sælland*, the largest of the islands, and the seat of the metropolis, Copenhagen, has an area of about 2,000 sq. miles. Its surface is in general very flat, and only a few feet above the level of the sea, and the highest of its few isolated elevations is not 500 ft. above the sea. The island is generally fertile and well-wooded, more especially in the s., but in the n. the soil is in many parts arid. Fünen (Dan. *Fyn*), the island next in extent, with an area of about 900 sq.m., is divided from Seeland by the Great Belt, and from Jutland by the Little Belt. It is less wooded than Seeland, and is intersected by a range of hills of inconsiderable height. The smaller islands of Laaland, Langeland, Falster, and Moen, with an area of 2,000 sq.m., are grouped to the s. of Fünen and Seeland, and exhibit the same physical and geological characters. They evidently, at some earlier epoch of the world's history, formed, together with those two larger islands, one connected whole, with Jutland on the w., and Sweden on the east. The n.e. shores of Seeland are separated from the latter country by a channel 70 m. in length, and only 1½ m. in breadth at its narrowest point, known as the Sound, or the *Öre Sund*, Ear sound, so denominated from its resemblance to the human ear. This channel varies from 10 to 19 fathoms in depth. The western coasts of Seeland are divided from Fünen by the Great Belt, a channel 9 m. wide at its narrowest point, and from 5 to 25 fathoms in depth—while the western shores of Fünen are separated from the peninsula of Slesvig and Jutland by the Little Belt, which is about four-fifths of a mile wide. The peninsula of Jutland, whose area is about 9,600 sq.m., was anciently, and even comparatively recently, covered with forests; but since their

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wasteful destruction, extensive tracts have become converted into sandy heaths, and in some parts it has been found necessary to sow bent-grass and plant trees, in order to prevent the mischief accruing to the cultivated lands by the clouds of dust raised by the wind. One third of Jutland has been rendered unfruitful by these causes, but where the few forests still remain, the neighboring districts are productive and well cultivated. Efforts have been made within the last few years to plant the heaths and drain the marshes of Jutland, and the results have on the whole been successful, more especially in regard to the latter, which are of considerable importance, since they supply large quantities of turf for fuel.

The coasts of D., both on the continent and in the islands, are indented with numerous bays or *fjords*, the largest of which is Limfjord, which intersects Jutland, and since 1825 has insulated its northern extremity by breaking through the narrow isthmus which had separated it from the North sea. It covers an area of 250 sq. miles. D. abounds in small lakes, the most considerable of which are Arre, Esrom, Fure, and Bavelse, all in the n. and w. parts of Seeland. But as no inland point is more than 30 or 40 m. from the sea, and the ranges of hills are low and interrupted, the country has no rivers properly so called. Intercommunication is, moreover, facilitated in the islands and in Jutland by various canals.

Climate and Soil.—The climate of D. is modified by vicinity to the sea, and is considerably milder, and the air more humid, than in the more southern and continental Germany. The cold is seldom very intense before Christmas, or after the middle of March. The summers are occasionally very hot, the weather generally may be characterized as very variable; rain and fogs are frequent. The main temperature in Copenhagen, whose climate may be regarded as representing an average of that of all D., is, in winter, 32.9°; spring, 43.5°; summer, 65.5°; autumn, 49.3° Fahrenheit.

Productions, etc. The system of land tenure is largely peasant proprietorship, for the soil is divided into small holdings, owing to laws which forbid the union of small farms into larger estates, and do much to encourage the parcelling out of the land. Under the Danish law the tenant has entire control of his landed property so long as the rent is paid. It is estimated that 80 per cent. of the land is productive, but of this about 6 per cent. is covered with forests and of the remainder a large part is pasture and meadow land. The agricultural returns for 1893 and succeeding years show an increase in the foreign demands for Danish agricultural produce. The leading cereal crops are oats, barley, and rye. The agricultural products next in importance are wheat, potatoes, hay, and clover. The commercial statistics for 1895, however, show that the ratio of Danish imports to exports in cereals was over 8 to 1. The Danish fisheries are not so important a branch of industry as might be expected when we consider the extended coast-line of the country, but the fiords abound in cod, herring, and other fish. The principal fish in Denmark are porpoises, herring, whitings, cod, flounders, mackerel, salmon, and eels. There are some extensive oyster beds. No part of the Danish territories is rich in minerals; but some coal is found in the island of Bornholm. Gypsum and salt also are found. On account of the lack of coal the manufacturing industries are of not much importance. Peat is obtained wherever there are swamps, and is of great value for fuel. Agriculture has improved considerably of recent years, but the defects, as well as the advantages, of peasant proprietorship are apparent. While the condition of the laboring classes in regard to food, shelter, and clothing, is fairly good, the subdivision of the soil prevents the expenditure of large capital in the improvement of the land. The peasants still continue to manufacture much of what they require within their own homes. As to manufactures in general, the making of machinery and pottery, iron smelting, distilling, and the manufacture of beet-root sugar are the chief branches of industry, but there is a considerable manufacture of bricks, tobacco, gloves, and cloth. Rich porcelain clays occur, affording good material for the manufacture of earthenware. Moreover, the abundant water power in every part of the kingdom facilitates manufacture. Domestic industry is chiefly confined to linen weaving and the making of wooden shoes, stockings, sacking, and lace.

Railways and Telegraphs.—In 1895 there were 1407 miles of railway open for traffic in D., of which about 1067 miles belonged to the government. The length of government telegraph lines at the end of 1895 was 3246 miles, and the length of wire 8686 miles.

Exports and Imports.—The chief exports are pork, butter, eggs, lard, animals and the cereals. The exportation of dairy produce has increased to an enormous extent. The report of the United States consul, dated Sept. 25, 1896, shows that the chief countries receiving the exports from Denmark for the five years 1890–94 were, in their order of importance, Great Britain, 56 7/10%, Germany, 24 5/10%, Sweden, 9 5/10%, Russia, 1 1/10%, America, 0.7%. Of the share received by America, the United States took 80%. In regard to the imports, the same authority shows the nations from which Denmark imported most largely in that period to be, in the order of their importance, Germany, 33 3/10%, Great Britain, 20 2/10%, Sweden, 14 3/10%, Russia, 9 1/10%, America, 6 2/10%. From this it appears that the foreign trade with Denmark was practically in the hands of the English, Germans, and Swedes. England alone took 55% of the total exports of bacon and butter. In 1895 Denmark exported to Great Britain 155,375,901 kroner, and imported from that country 68,650,727 kroner. To Germany, in the same year, she exported 65,548,053 kroner, receiving in imports 118,993,945. The exports and imports from the United States in that year were respectively 2,302,385 kroner and 10,084,955. As an illustration of the vast increase in the exportation of butter, it may be stated that Denmark's exports of butter into Great Britain rose from £767,190 in 1870, to £5,948,463 in 1895.

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In remarking on the small trade which the United States enjoys with D. as compared with that possessed by Great Britain and Sweden, it has been pointed out that American merchants do not send commercial travellers to D. with samples of their goods, relying upon price lists and catalogues more exclusively than do their successful competitors.

Revenue.—The constitution of Denmark provides that the annual budget be laid before the lower house, or Folkething, at the beginning of each session. The financial accounts for each year are examined by four salaried revisers, of whom two are chosen by the Folkething, and two by the upper house, or Landsthing. Their report is submitted to both chambers for approval. The revenue for 1896 was 79,051,735 kroner, and the expenditure 74,470,636 kroner. The estimated revenue and expenditure for 1896–7 were considerably less, being between 67,000,000 and 68,000,000 kroner. The estimates for the budget of 1897–8 show the chief sources of revenue to be indirect taxes, mainly customs and excise, which were expected to yield nearly two-thirds of the entire revenue Direct taxes were next in importance as a source of revenue in these estimates. A considerable income is derived each year from the state lottery. In the same estimates the largest item of expenditure was for the improvement of state property and the reduction of the debt, and the next in importance was the maintenance of the ministry of war. Since the war of 1866, the Danish government has maintained a large reserve fund for the purpose of having means to provide against war and other emergency, and this amounted on March 31st, 1896, to 17,863,517 kroner. This shows a falling off of nearly 100,000,000 kroner since the year 1867. During the early part of the period between these dates the interest of the fund thus accumulated constituted a very considerable item in the annual revenues of the state, and the national debt underwent a gradual reduction until 1880. Since then the debt has increased, and in 1896 amounted to 199,061,871 kroner. The debt has been incurred partly through deficits in the years before parliamentary government was established, and partly through the expenses of public works, such as the building of railways and the construction of harbors, lighthouses, etc. In 1896 the foreign debt constituted one-third of the total amount. Formerly the current coinage of D. consisted of Frederick's d'or ($3.25), silver specie-dollars ($1.00), a rix-dollar ($.50), divided into 6 marks of 16 skillings each. But under a law which came into force Jan. 1st, 1875, a decimal system of currency was introduced into D., the unit being the *krone*, divided into 100 öre. The krone is worth about 25 cents (26$\frac{8}{10}$ cts. in 1896), and is, therefore, about one-half the rix-dollar, which it has supplanted as unit. The gold coins are 20 and 10 kroner pieces. D. is a monometalic country, gold being the standard of value. Silver is legal tender to the amount of 20 kroner. Since 1839 the Danish pound-weight has been made equal to half the French kilogramme, and its fractions reduced to corresponding equivalents. With a similar view to facilitating international commercial relations, the old Danish ship-measure of a *laest* (150 cubic feet) was done away with in 1867, and the English tonnage system officially adopted. The present unit is the ship *last*, equal to 2 tons.

Army, Navy, etc.—According to law, all the able-bodied men who have reached the age of 22 years are liable to serve for eight years in the regular army and its reserve, and for a similar period in the extra reserve. Exemption from this duty can, however, be obtained under definite conditions, and by payment of the appointed penalties. The kingdom is divided into an Eastern and Western division, or command, the former comprising two and the latter three brigades. Each brigade is divided into two battalions, and furnishes its contingent of infantry and one regiment of cavalry. Exclusive of the extra reserve, which numbers about 16,500 officers and men, and can be called out only in emergencies, the total war strength of the army was in 1895, about 60,000 men. This, however, includes the Citizen Corps of Copenhagen and Bornholm island. The Danish navy is maintained for the purpose of defending the coast. The old Danish fleet, of which Denmark was deprived by England in 1807, is now represented by a small but well appointed force, consisting, in 1896, of 7 iron-clads, of which three were armoured cruisers of the first class, besides torpedo boats, port-defence vessels, etc. In 1896 an appropriation was voted for the construction of a new port-defence ship. The merchant marine of D. amounted, on Dec. 31st, 1895, to 3,590 vessels of four tons burden and upwards.

Education.—The educational institutions of D. have reached a very high degree of perfection, and few countries can compete with her in regard to the excellence of the system and its extensive application relatively to the amount of the population. Education is compulsory for children between the ages of 7 and 14, and poor parents pay only a nominal sum towards the support of the public schools, which are maintained by communal taxes and are free. The elementary schools amounted, in 1896, to about 2,940. There are several training colleges for the teachers of these public schools. Classical and other higher class education is afforded by an excellent university at Copenhagen, founded in 1479, and having in 1896 about 1300 students, and by a number of colleges, technical schools, agricultural schools, popular high schools, Latin schools, etc. Copenhagen contains the Royal Academy of Arts, and valuable public libraries, of which the Royal Library is the most noted, being especially rich in oriental and Icelandic manuscripts.

Religion.—The established religion of D. is Lutheran, to which the king must belong; but complete toleration is enjoyed in every part of the kingdom. The reformation was introduced in 1536, when Christian III. caused all the Romish bishops to be seized in one day, formally proclaimed their deposition from their sees, and incorporated the property of the church with that of the crown. D. is divided into 7 dioceses. The census of 1890 reported only 33,851 persons not belonging to the established church. Of these more than half belonged to other Protestant denominations; 4080 were Jews;

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3647 were Roman Catholics; and 941 were Mormons. The nomination of the bishops is vested in the king; they have no political character; but in other respects exercise nearly the same privileges within their dioceses as their English brethren of the same rank.

Constitution and Government.—The succession to the crown was not necessarily hereditary till 1660, when the people and the clergy, impelled by hatred towards the nobles, in whose hands the supreme power of the state rested *de facto*, constituted themselves into a national assembly, which invested the sovereign (Frederick III.) for himself and his heirs with absolute power, and declared the succession to the throne hereditary. From that time, the crown exercised the *dominium absolutum*, unchecked by any constitutional restraint, till 1831, when Frederick VI., yielding to the pressure of the times, granted a constitution to his people, and established an assembly of notables for the islands and Jutland; the duchies being governed by their own constitutional forms. The nation was at first perfectly satisfied with the amount of power conceded by the king, but after a time the anomalous character of the authority vested in the assembly created great political agitation and discontent. This feeling continued to increase under the reign of Frederick's successor, Christian VIII.; and on the death of the latter, his son and successor, Frederick VII., saw himself obliged to depart from the conservative policy of his father, and to grant, in 1849, the constitutional form of government which D. now enjoys, and which is based upon the most liberal principles. The national assembly or Rigsdag consists of the Folkething and Landsthing, and is invested with very extensive powers; it meets annually on the first Monday in October, and its members receive a fixed allowance during their sittings. The Landsthing is composed of 66 members, of whom 12 are chosen for life by the king, while the remainder are elected for a term of eight years by certain municipal and rural electoral bodies, who represent the large taxpayers of the kingdom. The members of the Folkething, whose number (which in 1896 was 114) varies with the population, the ratio provided by the constitution being one for every 16,000 inhabitants, are elected for three years by universal suffrage. It is required that all members of the Landsthing and Folkething shall have passed the age of 25, and all members of the former must be residents of the district from which they are appointed. Every male citizen 30 years of age or more, who is not in receipt of public charity or employed in private service, outside of his own household, and who has resided for one year in the electoral circle, where his name is inscribed on the list, has the right to vote. The Rigsdag must meet every year, and must, in the course of their session, consider and dispose of the annual accounts that the finance minister is bound to submit to their scrutiny.

The king must be a member of the Evangelical Lutheran church. He, with his ministers, make up the executive. The ministry is responsible and, under the presidency of the king, constitutes the State Council (Statsraadet) which consists of 8 distinct ministerial departments as follows: 1,—The Presidency of the Council and Ministry of Foreign Affairs; 2,—the Ministry of the Interior; 3,—Ministry of Justice, and for Iceland; 4,—Ministry of Finance; 5,—Ministry of War; 6,—Ministry of Marine; 7,—Ministry of Public Instruction and Ecclesiastical Affairs; 8,—Ministry of Agriculture. The ministerial heads of these departments are individually and collectively responsible to the Rigsdag for their actions, and cannot, under any circumstances, be condemned or pardoned by the sovereign without the concurrence of that body. D. is divided for administrative purposes into 18 *amter*, or jurisdictions, each presided over by a chief, or *amtmand*, who in Copenhagen alone bears the title of "over-president." Each county is divided into hundreds. The mayors of the towns are appointed by the government. Copenhagen constitutes a distinct district with its own administration. Iceland has a separate constitution and administration, under the charter of August 1st, 1874, by which legislative power is vested in the Althing, consisting of 36 members, of whom six are appointed by the king. At the head of the administration is a minister for Iceland appointed by the king, and there is a local governor, residing at Reikjavik, at the head of the local administration. Iceland is divided into two districts, the Eastern and the Western, each under the direction of an amtmand.

Justice. — The supreme court of justice is composed of four assistant judges chosen by the Landsthing from its midst, and four ordinary high judges. It holds its sittings at Copenhagen and alone can try parliamentary impeachments. Appeals are allowed from all the lower courts to the supreme court.

History.—The Kymri were the earliest known inhabitants of Scandinavia, and made themselves formidable to the Romans 100 years B.C. To them succeeded the Goths, who, under their mythical leader, Odin, established their rule over the Scandinavian lands. Odin's son, Skjold, is reputed to have been the first ruler of D.; but the little that is known of Danish history in those remote ages, seems to indicate that the country was split up into many small territories, whose inhabitants lived by piracy. The people were divided into "Bonder," freemen, and "Trælle," bondsmen. The former busied themselves with war, and "Vikingetog," or piracy, and the government of the land: while to the latter were left the peaceful pursuits of hunting, fishing, and tilling the soil. The mission of Ansgarius, the apostle of the north, to Southern Jutland in 826, where he baptized Harald Klak, one of the Smaa Kongar, or little kings of D., was the means of first opening the Danish territories to the knowledge of the more civilized nations. The country was soon torn by civil dissensions between the adherents of the ancient and modern faith. Gorm the Old, the first authentic king of D., the bitter enemy of Christianity, died in 935, after having subjugated the several territories to his sway; and although his death gave fresh vigor to the diffusion of the new faith, paganism kept

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its ground for 200 years longer, and numbered among its adherents many of those half-mythical heroes whose deeds are celebrated in the Eddas and the Kæmpeviser of the middle ages. The success that attended the piratical incursions of the Northmen, drew them from their own homes; and while Gorm's descendants, Svend and Knud, were reigning in England, D. was left a prey to anarchy. On the extinction of Knud's dynasty in 1042, his sister's son, Svend Estridsen, ascended the throne. Internal dissensions and external wars weakened the country, and the introduction of a feudal system raised up a powerful nobility, and ground down the once free people to a condition of oppressed serfage. Valdemar I., by the help of his great minister, Axel Hvide, known in history as bishop Absalon, subjugated the Wends of Rügen and Pomerania, and forced them, in 1168, to renounce the faith of their god, Svantevit, and accept Christianity. During the time of Knud VI., and in the early part of the reign of Valdemar II.—sons of Valdemar I.—the conquests of D. extended so far into German and Wendic lands, that the Baltic was little more than an inland Danish sea. The jealousy of the German princes and the treachery of his vassals combined to rob Valdemar II. of these brilliant family conquests. His death in 1241 was followed by a century of anarchy, and inglorious decadence of the authority of the crown, during which the kingdom was brought to the brink of annihilation under the vicious rule of his sons and grandsons. Under his great-grandson, Valdemar III., the last of the Estridsen line, D. made a quick but transient recovery of the conquests of the older Valdemars, and the national laws were collected into a well-digested comprehensive code. From his death in 1375 till 1412, his daughter, the great Margaret, first as regent for her only and early lost son, Olaf, and later as sole monarch, ruled, not only D., but in course of time also Sweden and Norway, with such consummate tact, and with so light yet firm a hand, that for once in the course of their history, the three rival Scandinavian kingdoms were content to act in harmony. Margaret's successor, Erik, the son of her niece, for whose sake she had striven to give permanence, by the act known as the union of Calmar, to the amalgamation of the three sovereignties into one, undid her glorious work with fatal rapidity, and, after an inglorious war of 25 years with his vassals, the counts-dukes of Slesvig-Holstein, he lost the allegiance and the crowns of his triple kingdom, and ended his disastrous existence in misery and obscurity. After the short reign of his nephew, Christopher of Bavaria, the Danes, on the death of the latter in 1448, again exerted their long-used ancient right of election to the throne, and chose for their king Christian of Oldenburg, a descendant of the old royal family through his maternal ancestress, Rikissa, the great-granddaughter of Valdemar II. Christian I., the father of the Oldenburg line, which continued unbroken till the death of the last king of D., Frederick VII., in 1863, laid the foundation of the Slesvig-Holstein troubles, which, after maturing for centuries, have ended in our own day in dismembering the Danish monarchy. Christian bought the empty title of count-duke of Slesvig and Holstein in 1460, by promising for his successors that they should forever leave the two provinces united, a pledge he had no right to impose, and they no power to keep; and by his failure to pay his daughter's dowry to her husband, James III. of Scotland, he lost for Norway her ancient provinces of the Shetlands and Orkneys, which had been given in pawn to the Scottish king. His unprofitable reign was followed by half a century of international struggles in Scandinavia. The insane tyranny of the otherwise able and enlightened Christian II., by exasperating the Danish nobles, and lashing the national anger of the Swedes to fury, cost him his throne, and gave him a lifelong cruel imprisonment among his subjects in D., who chose his uncle Frederick I. to be their king, while Sweden was forever separated from D., and raised under the Vasas (see GUSTAVUS I.) to be a powerful state. Christian III., in whose reign the reformation was established, united the Slesvig-Holstein duchies in perpetuity to the crown in 1533. His partition of the greater part of these provinces among his brothers became a source of much mischief to D., which did not end till 1773, when the alienated territory was recovered by the cession of Oldenburg and Delmenhorst to the grand-duke of Russia, the representative of the Holstein-Gottorp family. Frederick II., who increased the embarrassments connected with the crown-appanages, by making additional partitions in favor of his brother (the founder of the Holstein-Sonderburg family), was succeeded by Christian IV., 1588, who was the ablest of all the Danish rulers. His liberal and wise policy was, however, cramped in every direction by the arrogant nobles, to whose treasonable supineness D. owes the reverses by which she lost all the possessions she had hitherto retained in Sweden. The national disgraces and abasement which followed, led, in 1660, under Christian's son, Frederick III., to the rising of the people against the nobles, and their surrender into the hands of the king of the supreme power. For the next hundred years, the peasantry were kept in serfage, and the middle classes depressed; while the power of the crown rested in the hands of a Germanized nobility, who despised the language and usages of their country, and exerted the most baneful influence on the true national life. Many improvements were, however, effected in the mode of administering the laws, and the Danish kings, although autocrats, exercised a mild rule. The abolition of serfage was begun by Christian VII. in 1767, but not finally completed till twenty years later; it was extended to the duchies in 1804. The miseries of the reign of Christian's son, Frederick VI., due to the relations maintained by D. with Napoleon, brought the country to the verge of ruin. At war with Sweden, England, Russia, and Prussia, and with the finances in a depressed

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condition, the kingdom was threatened with bankruptcy; and although it had speedily rallied from the injuries and losses inflicted by the battle of Copenhagen, under Nelson, in 1801, the fresh rupture with the allies, which ended in the compulsory surrender to the English of the entire fleet, after the destructive bombardment of Copenhagen, Sept. 1807, completely paralyzed the nation. By the congress of Vienna, D. was compelled to cede Norway to Sweden. The discontent that had long been brooding in the duchies, degenerated after the stirring year of 1830 into mutual animosity between the Danish and German population, which was not allayed by the schemes devised by the court to meet the difficulties of the case. The anticipated failure of heirs to the throne complicated the questions at issue; and the Holstein party, being encouraged by the diet at Frankfort, and perhaps still more by Prussia, came to an open rupture with D. in 1848, hastened, no doubt, by the reaction produced all over the continent by the French revolution, and thus, on the accession of Frederick VII., half his subjects were in open rebellion against him. After alternate hostilities and armistices, the Slesvig-Holstein war was virtually concluded in 1849, by the victory of the Danes over Slesvig-Holsteiners at Idsted, followed by the conclusion of peace between D. and Prussia. The liberal constitution granted by the king fully satisfied his subjects in D. proper, but disaffection still smoldered in the duchies.

On the death, in 1863, of Frederick VII., the present king, prince Christian of Slesvig-Holstein-Glücksborg, ascended the throne under the title of Christian IX., in conformity with the act known as the treaty of London of 1852, by which the succession to the Danish crown had been settled on him, and his descendants by his wife, princess Louise of Hesse-Cassel, niece of king Christian VIII. of D. With Frederick VII., the direct Oldenburg line had expired, and, at his death, the question of the succession to the duchies acquired an importance which it had never before possessed. A pretender, backed by German influence and help, at once started up in the person of the eldest son of the duke of Augustenborg, whose defeat in 1848, and solemn renunciation of all claims on the titles or possessions of the Danish royal house, in consideration of his receiving a free pardon, and accepting a large sum of money from the crown, had been regarded in D. as the final settlement of his pretensions.

The cause of the Augustenborg prince, who assumed the title of duke Frederick VIII. of Slesvig-Holstein, was speedily merged and lost sight of by Prussia and Austria in their direct aim of incorporating the duchies with the German confederation. D., unaided by the neighbors and allies on whose support she had relied, was forced to go single-handed into the unequal contest. After a brave but utterly futile attempt at resistance, the Danes found themselves forced to submit to the terms conceded to them by their powerful foes, and resign not only Lauenborg and Holstein, but the ancient crown-appanage of Slesvig into the hands of the German confederate powers. By the peace of Vienna, 1864, the Danish king bound himself to abide by the decision which Prussia and Austria should adopt in regard to the destiny of the severed Danish provinces. The dissensions between these two great powers, which led to the Austro-Prussian war of 1866, and resulted in the triumph of Prussia, have left the fate of the Slesvigers entirely in the hands of the latter state, which has hitherto refused to relinquish its hold upon the province. Since the war, D., although reduced to the narrow limits of the islands and Jutland, has recovered from its fall, and the degree of political and social freedom enjoyed by the nation is now perhaps as high as is to be found in any country in Europe. See POLITICAL PARTIES, DANISH.

DENNER, BALTHASAR, 1685–1747; a German portrait-painter employed by Frederick the Great; went to England by invitation of George I., where he was not appreciated. His chief peculiarity consisted in the fineness of his mechanical finish, which extended to depicting even the almost invisible furze or hair growing on the smooth skin. Charles VI. paid 4,700 florins for a "Head of an Old Woman" by this artist.

DENNERY, or **D'ENNERY,** ADOLPHE PHILIPPE, a French dramatic writer of Jewish extraction, was b. at Paris on June 17, 1811. His first employment was that of clerk to a notary; he gave that up to become a painter; and afterwards, while still very young, he became a contributor to the newspapers. The first dramatic work in which he had a hand was brought out in 1831; this was *Emile, ou le Fils d'un Pair de France,* and it was produced by him in concert with M. Charles Desnoyer, a well-known *litterateur* and theatrical critic. It had some success, and D. followed it up with two or three others, which had so much popularity that his services as a play-writer came into considerable demand. He was a ready writer, and always able to come up to a fair standard of merit; and, encouraged by the theatrical managers of France, he has been one of the most prolific of dramatic authors. He has produced, by himself or in concert with others, about 200 pieces in one style or another; and a few years ago, five of his pieces were to be seen upon the Parisian stage at one time. Latterly, D. has been a man of business as well as an author. He was appointed director of the Théâtre Historique in 1850, but resigned this appointment almost immediately. An attempt which he made in 1855 to establish a new theater, which he first proposed to call the Théâtre du Peuple, and afterwards the Théâtre du Prince Impérial, did not succeed; but since that, he has had a large share in establishing and in managing a public company, in which many persons connected with the press and with the theaters were concerned—

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the Société Thermale de Cabourg-Dives. Of this company, whose speculation consisted in developing the attractions of a new watering-place (in the dep. of Calvados), he has been successively secretary and managing director. D. was decorated with the legion of honor on the 10th Dec., 1849, and was promoted to the rank of officer on the 16th of Aug., 1859.

DENNEWITZ, a small village in the province of Brandenburg, Prussia, 42 m. s.s.w. of Berlin. Here was fought, on the 6th of Sept., 1813, a battle between 70,000 French, Saxons, and Poles, commanded by Marshal Ney, and 45,000 Prussians, under Gen. Tauentzien. The fighting was obstinate to the last degree. Both armies more than once drove each other from their positions, but the patriotic enthusiasm of the Prussians finally prevailed, and Ney gave the order to retreat. At this moment Bernadotte, crown-prince of Sweden, appeared at the head of 70 battalions of Russians and Swedes, supported by 10,000 horse, and preceded by 150 pieces of cannon. These fresh troops turned the retreat into a complete rout, until the whole of the French army presented nothing but a vast mass of fugitives. The French lost 15,000 killed, wounded, and prisoners (the Germans say 20,000), and 43 pieces of cannon. The allies lost 6,000 killed and wounded, of whom 5,000 were Prussians. The most important feature of this victory to the Prussians was that most of their troops were *landwehr* (militia), for whom Napoleon had expressed the utmost contempt, designating them a "rabble."

DENNIE, Joseph, 1768–1812; b. Mass.; graduated at Harvard in 1790. In 1795, he became connected with the *Tablet*, a Boston weekly journal; and the same year established *The Farmer's Weekly Museum* at Walpole, N. H., in which he published, over the signature of "The Lay Preacher," a series of papers which attracted universal attention. In 1801, he began the *Portfolio* at Philadelphia, and adopted the *nom de plume* of "Oliver Oldschool." This publication was the channel through which the letters of many great men appeared.

DENNIS, a t. in Barnstable co., Mass., 82 m. s.e. of Boston; pop. '90, 2899. The township extends quite across the peninsula, and is intersected by the New York, New Haven, and Hartford railroad. Cultivation of cranberries and fishing are carried on.

DENNIS, John, the son of a London saddler, was b. in London in 1657. He was put to school at Harrow; and afterwards, in 1675, he went to Caius college, Cambridge. Four years afterwards he removed to Trinity hall in the same university, and in 1683 took there his degree of M.A. After leaving Cambridge, he traveled on the continent, passing through France and Italy. Returning home, and in the possession of a small fortune, he joined the whigs, and brought a sufficiently rancorous pen to the assistance of his party. He formed the acquaintance of Dryden and Wycherley, and other distinguished wits of the time, and instigated by companionship, as well as by native bent, he made various attempts as a theatrical writer. He d. in 1734. D. made many enemies; and his name, which his own writings could not preserve, will live for ever in their contempt and hate. He is one of the best abused men in English literature. Swift lampooned him, Pope assailed him in the *Essay on Criticism*, and finally "damned him to everlasting fame" in the *Dunciad*.

DENNISON, William, was b. in Cincinnati, O., in 1815, was educated at Miami, and practised law until 1848, when he was elected to the state legislature. He was president of the Columbus and Xenia railroad, was elected governor of Ohio in 1860, and succeeded in enlisting 30,000 soldiers. He was appointed postmaster-general in 1864, and has been a generous contributor to Dennison college, at Granville, O. He died in 1882.

DENON, Dominique Vivant, Baron, was b. at Châlons-sur-Saône, Jan. 4, 1747. At an early period, he went to Paris, to study law, but quickly betook himself to the fine arts, and acquired a high reputation as an amateur and art critic. During a residence in Southern Italy, he spent much of his time in studying etching and mezzotint engraving, and along with the abbé St. Non, wrote a *Voyage Pittoresque de Naples et de Sicile* (Par. 1788). Afterwards, he lived at Venice, and other Italian cities, but returned to France during the revolution. Having, at the house of Mme. Beauharnais, formed the acquaintance of Bonaparte, he was chosen by him to accompany the expedition to Egypt in the capacity of a *savant*. He was indefatigable in drawing the relics of ancient Egyptian art. In 1802, he published his *Voyage dans la Basse et la Haute Egypte*, the engravings attached to which admirable work are very correct, and prove D. to have been a skillful artist. As a member of the Egyptian institute, he had also the most important part in the *Description de l'Egypte* drawn up by that learned body. Bonaparte now made him inspector-general of museums, in which capacity he exhibited great ability. He accompanied Bonaparte in various subsequent expeditions, and suggested to him what art-treasures of the conquered cities would be most suitable for the Louvre. After 1815, he was dismissed from his office. The remaining years of his life were occupied in preparing for publication a history of art, to be illustrated by the best artists, but he did not live to finish it, having died 27th April, 1825. D.'s work was completed by Amaury Duval, and published in 1829, under the title *Monuments des Arts du Dessin chez les Peuples tant Anciens que Modernes*. D. himself executed as many as 300 etchings, chiefly imitations of the style of Rembrandt.

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DÉNOUEMENT (Fr. from *dénouer*, to untie, which again is from *nœud*, a knot). In fiction this term is generally applied to the termination or catastrophe of a play or romance; but, more strictly speaking, it designates the train of circumstances solving the plot, and hastening the catastrophe. A good dénouement in a novel or play should be natural, as a result of the preceding plot, and yet should not be so obvious as to be easily anticipated. Forced and arbitrary solutions of plot, offending against nature and common-sense, are frequently perpetrated for theatrical effect (*coups de théâtre*).

DENS, PETER, a well-known Roman Catholic theologian, was b. in 1690, at Boom, in Belgium. The scanty information we possess about D. is derived from the epitaph inscribed on his tomb. From this epitaph it appears that he was reader in theology at Malines (something equivalent to our professor of divinity) for twelve years, *plebanus* or parish priest of St. Rumold's or Rumbold's church in the same city, and president of the college of Malines for 40 years. He also held various honorary church offices. He was canon and penitentiary, synodical examiner and scholastic archpriest of St. Rumold's—the metropolitan church of Belgium. He died 15th Feb., 1775, in the 85th year of his age. The work which has rendered D.'s name familiar, even to the Protestant public, is his *Theologia Moralis et Dogmatica*. It is a systematic exposition and defense—in the form of a catechism—of every point of ethics and doctrine maintained by Roman Catholics, and is extensively, if not generally, adopted as the text-book of theology in their colleges. The casuistical parts of the work have been severely criticised by Protestant moralists.

DENSITY. When of two bodies of equal bulk or volume, the one contains more matter than the other, it is said to have greater density than that other. The quantity of matter is measured by the weight, and thus density and specific gravity come to be proportional to one another. Platina, which is about 21 times the weight of water, long passed for the densest body; but Breithaup, of Freiburg, in 1833, made out *iridium* to be twice as dense. Rare is opposed to dense, and the rarest body known is *hydrogen*, which is about 14½ times rarer than atmospheric air. The density of bodies is diminished by heat, and increased by cold. See HEAT, MATTER.

DENT, a co. in s.e. Missouri, reached by the St. Louis and San Francisco railroad; 720 sq. m.; pop. '90, 12,149, includ. colored. The soil is fertile; productions agricultural. Co. seat, Salem.

DENT, FREDERICK TRACY, an American soldier, was b. in Missouri in 1820; graduated at West Point in 1843. He served in the Mexican war, being present at the siege of Vera Cruz, and the battles of San Antonio, Churubusco, and Molino del Rey, served in the survey for the Pacific railroad, and was a member of the Yakima expedition in 1856. He was sent to New York city in 1863 to suppress riots. He was secretary to Grant during the latter's first term as president. He was retired in 1883.

DEN'TA, or GYENTA, a market t. of Hungary, situated on the Berzava, about 30 m. s. of Temesvar. It has several large annual fairs. Pop. abt. 3000.

DENTAL SYSTEM. See TEETH.

DENTALIUM (Lat. *dens*, a tooth), a genus of marine gasteropodous mollusks, of the order *tubulibranchiata*, having two symmetrical *branchiæ* (gills), which are inclosed, along with all the other soft parts of the body, in an elongated shelly tube. The tube is conical, somewhat curved, and has a considerable resemblance to an elephant's tusk in miniature. Until recently, from a mistake originating in the similarity of its branchiæ to those of some of the *annelides*, the D. was ranked in that order. Fossil species abound in the tertiary formations.

DENTALS. A name given to the sounds represented by the letters t, d, th, as made by the tongue against the teeth (*dentes*).

DENTA'RIA, a genus of plants of the natural order *cruciferæ*, having a lanceolate compressed silique. One species only, *D. bulbifera*, is found in Britain, and is a rare plant, with a simple stem, the lower leaves pinnate, the upper leaves simple, and rose-colored flowers, the axils of the leaves producing bulbs, and the creeping rhizome having tooth-like knobs, whence the name D., and the English name coral-root. The root, when dried, is said to have greater pungency than pellitory of Spain, and was formerly used in the same way for toothache. *D. diphylla*, a North American species, is called pepper-root from the same property.

DENTATUS, MANIUS (or MARCUS) CURIUS, a Roman consul in the first half of the 3d c. B.C. He was made consul in 290, and conquered the Samnites; he defeated Pyrrhus in two important engagements in 275, and the next year reconquered the Samnites, and also defeated Lucanians and Bruttians. At the close of his third term as consul he retired from public life and cultivated his farm. He was elected censor in 272, and while in office built an aqueduct to bring water into the city, and a canal for draining marshy land. His name "Dentatus" was given because it was said that he was born with teeth.

DENTEX, a genus of acanthopterous fishes of the family of *sparidæ* (Sea-breams, etc.), having a deep compressed body, and generally perch-like form; a single dorsal fin, the anterior rays of which are spinous; scaly cheeks; and many small conical teeth, among which are in each jaw at least four large canine teeth, elongated, and curved inwards. One species (*D. vulgaris*), the *Dentex* of the ancient Romans, abounds in the Mediterra-

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nean, and has occasionally been taken on the southern shores of Britain. It is sometimes called the four-toothed sparus. It attains a large size, sometimes 3 ft. in length, and 20 to 30 pounds weight. It is an excessively voracious fish, as its large canine teeth might be held to indicate, devouring other fishes; but is itself in much request as an article of human food, and great numbers are taken in the mouths of rivers in Dalmatia and the Levant. It is there also a considerable article of commerce, being cut in pieces, and packed in barrels with vinegar and spices, in which state it will keep good for twelve months. It was preserved in the very same way by the ancients.

DENTIFRICES are substances, generally powders, which are employed as aids in cleaning the teeth. Charcoal and cuttle-fish bone-powder are useful as detergents; chalk, as a soft powder; and pumice, as a hard gritty substance for occasional use, when the teeth are more than ordinarily colored. Catechu, cinchona, and rhatany are employed to give astringency to the tooth-powder; myrrh, to impart odor; and bole armeniac, to communicate a red color. Common salt, cream of tartar, phosphate of soda, and sulphate of potash, are occasionally used; and where the breath has an unpleasant odor, the addition of 4 parts of bleaching-powder (chloride of lime) to the 100 of the tooth-powder, removes the fœtic character of the breath, and also tends to whiten the teeth.

DENTILS (Lat. *dens*, a tooth), in the Ionic, Corinthian, and Composite orders of architecture, are ornaments resembling teeth. See ENTABLATURE.

DENTINE is the thin layer of cement or enamel which more or less coats the teeth of the mammalia, and from the compactness of its structure and fine texture, it is generally called the ivory of the tooth. It is very hard and durable, and consists mainly of phosphate of lime accompanied by gelatine.

DENTIROSTRES, a tribe or sub-order of birds, of the order *insessores*, characterized by a bill with a marginal notch towards the extremity of the upper mandible. It is composed chiefly of insectivorous birds, although the shrikes (*laniadæ*), which belong to it, prey also on small birds, quadrupeds, and reptiles. Among the other families of D. are *merulidæ* (thrushes, etc.), *sylviadæ* (warblers, etc.), *ampelidæ* (chatterers), and *muscicapidæ* (flycatchers, etc.).

DENTISTRY, the art of the dentist, or that of treating disease in the teeth (*dental surgery*), and of replacing these organs when lost (*mechanical dentistry*).

I. DENTAL SURGERY.—The disorders to which the teeth are liable are those arising from defective development, such as imperfections in form or structure, irregularity of position, etc.; these, again, constituting diseases more properly so called, such as caries or dental decay, necrosis or death of a tooth, inflammation or neuralgia of the soft tissues connected with them, such as the gum, the central pulp or *nerve*, etc.; lastly, those arising from accident of various kinds, such as blows, falls, and the like.

The treatment of all these different affections is generally of a *local* kind; or, in other words, confined to the spot in which the disease manifests itself. But dental diseases themselves are not always of a purely local nature; and it may be generally stated that wherever a tooth becomes diseased without any well-marked or ostensible cause, such a tooth has been originally defective or weak. It has been, in fact, imperfectly developed, and this imperfection is due to *constitutional* causes, or such as affect the general health of the individual. In this way, a very slight cause is sufficient to excite disease in, and lead to the destruction of, such a tooth. Disease impairs what of such little vitality it already possesses; it become less and less able to resist the action even influences as it is naturally exposed to in the mouth—chemical decomposition is set up, and the substance of the tooth is broken down, and decays—literally, rots away. This, in most cases, constitutes the pathology of dental caries; but there seems no doubt that in other instances caries, like any other morbid action in the bodily tissues, may commence in teeth previously quite healthy.

The object of the dentist, in these circumstances, is two-fold: he either attempts to arrest the decay, and repair its ravages; or he removes the diseased tooth altogether. These operations, along with supplying artificial teeth when the natural ones are lost, constitute, with those for the treatment of various minor affections, the main offices of dentistry.

Premising that all operations in dentistry require to be modified according to different cases, we shall shortly describe the various manipulations required in their performance.

Scaling.—This is a little operation, by which the accumulation of a substance termed "tartar" is removed from the teeth. Tartar is a deposit from the saliva, and lodges in greatest quantity most commonly behind the lower front teeth. Where it accumulates it is generally accompanied by absorption of the gums, whereby the necks of the teeth are exposed, and they become loosened, and fall out. Its removal is effected by little hoe-shaped steel instruments, bent in a manner to reach more easily those situations in which the tartar is found. Their mode of use is by inserting the point of any one of them under the free edge of the mass of tartar, at the gum, and lifting it away from the backs of the teeth to which it is adherent. The teeth are then freed from any par-

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ticles still sticking about them, and their surface smoothed by being rubbed with pumice-powder or chalk.

Regulating.—The teeth of the second, or permanent or adult set, are very liable to be crowded and misplaced, one overlapping the other, or those of the upper jaw falling behind those of the lower when the mouth is closed, thus producing the prominent condition of the under-jaw denominated "under-hung." To remedy these defects, a variety of means have been adopted by dentists; the principle upon which all of them act, however, being that of pressing the displaced tooth or teeth into the natural position. This, of course, requires that room or space should exist for them to be thus adjusted; and where this is not the case, the usual procedure is to remove one or more of the back-teeth, or any others which it is less desirable to preserve. Some considerable time is necessary to complete the regulation of misplaced teeth; and even after they have assumed their proper position, they require to be carefully maintained there, otherwise a tendency to resume their former irregularity soon manifests itself.

Stopping or Filling.—This is one of the most important and delicate operations the dentist has to perform. The first step to be taken in filling or "stuffing" a tooth, as it is sometimes called, is to clear away all decayed and decaying substance. For this purpose, a number of slender digging and excavating steel instruments, termed "excavators," are required. With these the hollow in the tooth is scooped out and thoroughly cleaned. If pain be occasioned by this process, the operation of "destroying the nerve," as it is called, had better at once be resorted to. This is performed in several ways. Where the tooth is single-fanged, as in front-teeth, the nerve, or more correctly the pulp, may be bored out by passing a slender broach, or square and pointed steel wire, up into the central cavity of the tooth, with a slight rotary motion. When this cannot be done, however, the best plan is to destroy the nerve by some caustic application, such as arsenious acid, chloride of zinc, carbolic acid, etc., carefully applied. The method of doing this is to clean the tooth thoroughly out, and then to apply a little of the caustic on a pellet of cotton wool about the size of a barley-pickle or a grain of rice—pressing it well into the decayed hollow, and then filling it over with soft bees-wax. This should be allowed to remain there for six, eight, or twelve hours; it may at the end of that time be taken out, and the filling proceeded with.

The cavity being properly shaped and cleaned out until its walls are of sound and hard tooth-bone, it is to be well dried, and the plug of filling material inserted. Various substances are employed for this purpose, and the mode of using each is somewhat different. For temporary fillings, pure gutta-percha is a serviceable material. A quantity sufficient to fill the cavity, and somewhat more, is to be gently warmed over a spirit-lamp—not in hot water—and when quite plastic, is to be firmly pressed with a blunt-pointed stopping-instrument or "plugger," into all the interstices of the hollow in the tooth—more and more being pressed in, until the surface of the plug so formed is on a level with the surface of the tooth, when all the superfluous portion should be removed, and the solid plug smoothly finished.

A set of fillings known as osteo-plastic fillings have recently been introduced, and are inserted into the tooth in a soft condition, where they harden in the course of a few minutes.

Another variety of filling-material consists of amalgams of different kinds. Many absurd statements have been made regarding the evil effects of amalgam fillings, but the only real disadvantage attending their use is shrinkage, and that many of them get black in the mouth, and discolor the tooth, while some that do not get black are friable, and crumble away in a short space of time. They are to be readily obtained, made up, and under various names. None of them seem very much superior to what is known as the platinum and gold alloy amalgam. The amalgam, then, whatever one it may be, is to be rubbed up with mercury to a firm, plastic consistence, and carefully introduced into the dried cavity in the same way as described regarding the gutta-percha, and is to be finished off in precisely a similar manner.

Gold-filling is an operation of a much more complicated and difficult description. The materials used here are either gold-foil—that is, thick gold-leaf—or the peculiar substance, or rather the peculiar form in which gold exists, known as sponge-gold, or "pellets" of gold made up in a soft spongy condition of various sizes ready for use. In filling a tooth with gold, even more care is necessary in preparing the cavity than what has been already inculcated. Its *shape* must now be particularly taken into account, and the nearer it approaches to a cylindrical form the better. The gold-foil, when it is employed, should be cut into strips, their breadth varying according to circumstances. Various modes of packing the gold are adopted, the chief object being that the foil shall lie in the cavity in such a way that its edges, and not its flat surfaces, shall be presented at the surface of the plug; otherwise the plug will be liable to injury by layers of it peeling off. In stopping with sponge, or other forms of gold, the preparatory steps are the same as for foil-stopping; it is, however, necessary to be more careful that no moisture be allowed to interfere with the operation.

The surface of a gold plug, formed in either of these ways, should be well consolidated by hard pressure with a blunt plugger, or lightly hammered with a suitable mallet, and the superfluous portion being removed, it ought to be burnished until it assume a brilliant metallic lustre.

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Extraction.—This is one of the commonest operations falling to the dentist. It is most frequently demanded in consequence of what is termed toothache—a disorder which, however, is not always one and the same in its nature. This want of uniformity in the nature of those diseased states to which teeth are subject, and which are comprehensively denominated toothache, leads to the conflicting results obtained from those applications recommended for its cure. These remedies are numerous, and of various characters. To explain their mode of action, and the particular symptoms indicating the selection of each one in preference to another, would here be out of place. Their intention, in general, is either to destroy the nervous fibers existing in a tooth, or to narcotize and render them insensible. Among those acting in the former manner are such as creosote, arsenious acid, carbolic acid, pepsine, chloride of zinc, nitrate of silver, alum, tannin, etc.; among those acting in the latter mode are chloroform, laudanum, ether, spirit of camphor, etc. There is no necessity for describing the method of their application, further than to remark, that in all cases the decayed cavity should previously be well cleaned out, otherwise the remedy employed may be altogether prevented from reaching the spot where it is intended to act.

Where extraction comes to be demanded, it is performed by means of instruments adapted to the special peculiarities of the tooth requiring removal, or to the circumstances in which it exists. The great matter is, that each tooth should be extracted in accordance with its anatomical configuration; and to accomplish this, of course, requires an intimate knowledge of the natural form proper to each of these organs individually; without this, it is impossible to extract any tooth upon a correct principle. The tooth is grasped, as far as the instrument can be made to do so, by that portion of the root or fang which just emerges from, or perhaps which is just within, the socket; it is then loosened, not exactly by pulling, but rather by moving it in a lateral or in a rotatory manner, in strict accordance with the respective character of fang possessed; and finally, on its being thus detached from its connection with the jaw, it is, with very little force, easily lifted from its socket.

Anæsthetics are employed in the extraction of teeth in the same manner as for other surgical operations, where it is desirable to abolish pain. Ether and chloroform are the only agents of this nature which have as yet been found generally fit for practical application in any operation of a prolonged character. Chloroform tends to depress the circulation when far pushed, and in this way should be watched with care during its administration. Ether, again, has little of this tendency, but requires larger time to induce insensibility, is more exciting and persistent in its effect, while the odor of this preparation remains about the patient for hours. Both of these agents are liable to occasion sickness, and as a variety of accidental and collateral difficulties may arise during their exhibition, they ought not to be given by inexperienced hands.

An anæsthetic proposed at the end of the last century—namely, nitrous oxide or laughing-gas, has been revived, and its application in dental surgery has been of much service, answering all the purposes of chloroform or ether in short operations. Like these, it requires careful employment, and in some cases it would better be avoided if possible—such as in elderly patients of a full habit, or those who may have suffered from any lesion of the nerve centers, from hæmoptysis, etc. Other modes of inducing insensibility, local or general, have been proposed from time to time, but one after another has been abandoned as unserviceable. At the present time muriate of cocaine (see COCAINE) in a 5 to 10 per cent. solution is often used to numb the sensitive parts temporarily, being injected hypodermatically into the surrounding tissues.

II. MECHANICAL DENTISTRY.—The manufacture of artificial teeth, and other matters comprehended in mechanical dentistry, involve many subjects of which no adequate or satisfactory idea can be conveyed by mere description. Nothing beyond a mere outline of the materials employed and the leading processes involved in this branch of art, can be given without practical illustration. The various conditions of the mouth requiring the adaptation of artificial teeth, range from cases where only one tooth may be wanting, to those where not a single tooth remains in the jaw, above or below. Accordingly, artificial teeth are spoken of as partial or complete sets—a partial set being one for either upper or lower jaw, where some of the natural teeth still remain; a complete set being one for either jaw, where none are left, or for both jaws, when both are in such circumstances.

The simplest form of partial sets is what is termed a pivoted tooth. This is an artificial tooth fixed in the mouth upon the fang or root of one whose crown has been lost by decay or otherwise. The mode of procedure is as follows: An artificial tooth, as near as possible to the color and form of that to be replaced is selected. This artificial tooth may be either the crown of a natural human tooth corresponding to that lost, or one made in imitation of this, in a species of pottery-ware, and by a process much too long for detail in this place. Such *mineral teeth*, as these last are termed, are manufactured on an extensive scale, and sold ready for use to dentists. A tooth of either kind, then, being selected, is accurately fitted to the root remaining in the mouth, and, by means of a gold pin, adjusted to, and inserted into the open central canal existing in the root—the other extremity of this gold pin being attached

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to the substitute tooth—the whole is fixed in its natural position, in a manner that renders detection almost impossible

When more than one tooth is required, and occasionally even where only one is necessary, a somewhat different contrivance is had recourse to. What is called a "plate" requires to be fitted to the gum and remaining teeth in so precise and perfect a manner as to lie quite firmly and steadily in its place, and to which the artificial teeth required are subsequently fixed,

This "plate" is frequently made of gold, silver, or platinum plate, of the thickness of card-board, in which case, the name of "plate" is used in its literal signification. But such plates may be made of other substances besides those of gold, silver, etc., such as the ivory of the walrus, or the hippopotamus's tusk, formerly used, but now almost entirely superseded by vulcanized india-rubber (q.v.) or vulcanite. The first step in any of these processes is to obtain an exact model of the gum and other parts upon which the plate is to rest. This is obtained by introducing bees-wax, or gutta-percha, or other modeling compound, softened by previous heating, into the patient's mouth, and pressing it forcibly upon those parts of which an impression is desired. On removing the wax or other substance from the mouth, Paris plaster is poured into the mold thus procured, and on its hardening, or "setting," this plaster-cast presents an exact counterpart of the gum. It is upon this plaster-model that all the subsequent operations are performed in fitting the artificial set. The following is a very brief sketch of the principal steps in working each of the most ordinary methods employed for these purposes:

Metallic-plate Sets.—Where the framework lying upon the gum is to be of gold or silver plate, or the like, it is necessary to procure, besides the plaster-model, a metal one. This metal-model is generally cast in zinc, gun-metal, or some such material; and a counter-model of a softer metal, generally lead, is taken from this again, so that a complete pair of dies is in this way procured. The gold or other plate, cut of a convenient size, is then stamped between the two metallic dies, and so made to assume the precise form desired. It is then trimmed, and any more delicate adjustments made upon it, such as soldering bands or clasps round those parts where it is to embrace any teeth remaining in the mouth, and finally completed by having the individual artifical teeth added to it, and adapted to the comfort and convenience of the wearer. The mode of fastening the teeth to the plate is in one of two ways. One kind of teeth have a tube extending along their whole length, and these are fastened by means of a pin fixed to the plate, upon which the tooth is secured by this pin passing up the tube alluded to. The other kind are provided with short platinum pins, fixed in the material of the tooth during its manufacture, to which pins a piece of gold or other plate is soldered, or a mass of gold fused upon them, and this, again, soldered to the framework of the set itself, wherever they are required.

Vulcanite Sets.—The first step in the manufacture of a vulcanite set of teeth is to make a pattern set in wax, with the mineral teeth constructed for the purpose, and which are to be used in the piece when it is finished, fixed in the wax; the whole constituting, in short, an exact fac-simile of what the completed set is intended to be. This pattern set is, of course, made upon and fitted to the plaster model, and is adjusted to the wearer's mouth precisely as if it were the set to be worn there. When everything is thus prepared, a duplicate of the wax-set is made in vulcanite—the vulcanite replacing the wax, and the mineral teeth being retained as they were. The process by which the vulcanite is made to take the place of the wax consists in imbedding the pattern set in Paris plaster, so that the mold of it, thus secured, may be separable into at least two parts. On these being taken asunder, the wax of the pattern set is melted out with boiling water, leaving the teeth *in situ*. The wax is then replaced by raw vulcanite, which, on the mold being reclosed, is subjected to the usual process of vulcanizing.

The foregoing description comprehends most of the ordinary operations connected with surgical and mechanical dentistry. Space, however, forbids an enumeration of many ingenious and beautiful inventions lately introduced by American dentists, who have done so much to raise dentistry to the position of a science, and who are recognized throughout the civilized world as standing at the very head of their profession. For further details reference should be made to the works of Taft, Richardson, and others, and to the special periodicals devoted to the progress of dentistry.

DENTI'TION, Period of (Lat. *dentitio*, the process of teething, from *dens*, a tooth). In man and most mammals, there are two distinct sets of teeth; one set which appears shortly after birth, and which are termed the *milk* or *deciduous* teeth; and a second set, which, after a few years, replaces these, and which are termed *permanent* teeth.

In the human subject, the milk-teeth are twenty in number, each jaw containing (from before backwards) four incisors, two canines, and four molars; while the permanent teeth are thirty-two in number, each jaw containing four incisors, two canines, four premolars or bicuspids, and six molars. Anatomists are in the habit of briefly expressing the number of the different kinds of teeth in any mammal by what they

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term a *dental formula*. The permanent teeth in man are represented by the formula, $i\frac{2-2}{2-2}, c\frac{1-1}{1-1}, p\frac{2-2}{2-2}, m\frac{3-3}{3-3} = 32$, where the letters *i*, *c*, *p*, *m*, stand for incisors, canines, premolars, and molars, and where the two terms in each numerator and in each denominator represent the number of each particular kind of tooth in each half of the upper and lower jaw respectively. As these formulæ are of common use in most works on zoology and comparative anatomy, we add another example—that of the permanent teeth of the hog, whose formula is $i\frac{3-3}{3-3}, c\frac{1-1}{1-1}, p\frac{4-4}{4-4}, m\frac{3-3}{3-3} = 44$: which signifies that there are on each side of both upper and lower jaws three incisors, one canine, four premolars, and three molars, making in all 44 teeth.

For a general description of the form and uses of these different kinds of teeth, we refer the reader to the article Digestion, Organs and Process of, where their special uses are noticed in reference to the digestive function; while the history of their structure, etc., is given in the article Teeth.

The following is the usual order and period of appearance of the milk-teeth: The four central incisors usually appear through the gums about the seventh month after birth, those of the lower jaw showing themselves first. The lateral incisors next appear between the 7th and 10th months; the anterior molars show themselves about the 13th month, and are soon followed by the canines, which usually appear between the 14th and 21st months. The posterior molars are the last and most uncertain in their time of protusion, which may range from the 18th month to the end of the 3d year. Except in the case of the incisors, there is no definite law as to whether the upper or lower teeth first appear.

About the middle or end of the 7th year, the jaw-bones have become sufficiently elongated to permit the appearance of the first true molar; and about the same time, the central incisors are replaced by the corresponding permanent teeth. The advance of the permanent teeth towards the surface of the gum causes the absorption of the roots of the temporary teeth, and thus facilitates their shedding; the crown falling off, and leaving room for the permanent tooth behind it to come forward and supply its place.

In the replacement of the first by the second set of teeth, the following order is observed: The middle incisors are first shed and renewed (usually when the child is about eight years of age), and then the lateral incisors (perhaps a year later). The anterior molars of the first set are then replaced by the anterior premolars (this usually happens about the 11th year); and about a year afterwards the posterior deciduous molars are replaced by the second premolars. The persistent canines take the place of the deciduous ones in the 12th year; these being the last of the milk-teeth to be exchanged. The second molars appear between the ages of twelve and a half and fourteen years; and the third molars, or *dentes sapientiæ* (wisdom teeth), seldom appear till three or four years subsequently, and often much later.

Dangers attending Teething.—The teeth are formed in closed sacs, and in rising to the surface in the progress of their growth they slowly penetrate the gum from below; a process familiarly called "cutting the teeth." The minuter physiology of this process will be described in a separate article (see Teeth); in the present it will be sufficient to indicate shortly the dangers to which children are exposed, particularly during the period of the first dentition, or from five months old to two years or more. Infants are occasionally said to die of "teething;" but this, like many other vague terms, may be said to be only a cloak for ignorance; for the mere cutting of the teeth is never, by itself, mortal, or even a serious source of suffering. It only becomes a cause of disease by its reflected influence on the delicate nervous system of the child. The period of dentition, in fact, is one during which the whole organization of the infant is undergoing a revolution; in passing from an exclusively milk-diet to one of a more complex character, the entire digestive system undergoes a corresponding development. The diseases of this period of life correspond in importance with the great physiological changes taking place in it, and with the dangers of derangement in the just order or symmetry of their development. If these diseases often appear to be due directly to the cutting of a tooth, it is because complex causes of disorder have prepared the way for a morbid change, which is ready to be developed into activity by a comparatively slight irritation. The principal diseases of dentition are diarrhea (q.v.), convulsions (q.v.), vomiting, and hydrocephalus, or tubercular inflammation of the membranes of the brain, which are all apt to originate at this period of infantile life, and to coincide more or less closely with the development of the first set of teeth. It is very doubtful how far the operation of cutting the gum with a lancet, so commonly supposed a specific for the diseases of dentition, ought to be encouraged. Sometimes there is evident irritation, or even inflammation of the gum, and then the operation will probably at least do no harm; but the indiscriminating use of the gum-lancet, at the request of anxious but foolish mothers and nurses, is characteristic of a weak and erroneous routine practice, and must be denounced as an unwarrantable interference with the truly beautiful process by which the tooth is gradually evolved from its socket, in most cases without any suffering. The special treatment of the diseases of dentition is discussed under the separate articles devoted to some of these diseases.

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DENTON, a co. in n.e. Texas, on the upper waters of Trinity River; 900 sq. m.; pop. '90, 21,289, includes colored. Co. seat, Denton.

DENUDA'TION is the removal of solid matter by water in motion, whether of rivers or of the waves and currents of the sea, and the consequent laying bare of some inferior rock. The rate of abrasion depends upon the velocity of the current, and the nature of the solid materials through which it flows; these two causes equally affect the deposition of the abraded matter, for the carrying power of the water varies with its velocity and with the weight of the particles. The heavier débris—large stones and gravel—are carried short distances, and deposited generally in masses; the finer particles are conveyed even by a slow current to great distances, and scattered in thin layers over extensive districts. All deposition, except in the case of showers of volcanic ashes, is the sign of a superficial waste going on contemporaneously, and to an equal extent, elsewhere, the gain at one point being equal to the loss at another. No new material has been used in the formation of the sedimentary rocks. The degradation and abrasion of igneous rocks provided the materials of the earliest strata; these in their turn were frequently abraded and re-deposited, under new conditions, and with the remains of a newer fauna and flora. Thus the crust of the globe has not actually increased in thickness, for whenever it acquires density in one place, it becomes thinner in another. The changes that have been effected by denudation, and the amount of matter thus transported, are difficult to imagine. In districts where faults occur, the surface has been smoothed, and the uptilted ends have been washed away. These faults sometimes extend over several hundred sq.m., and the dislocations, had they remained unaltered, would have produced mountains with precipitous escarpments of different heights, reaching occasionally to a thousand feet. But denudation not only leveled the surface of the earth; in regions with horizontal stratification it has produced inequalities, hollowing out valleys of denudation, and often carrying away the whole of the superficial strata, leaving mountains here and there which show, by the direction and succession of their beds, that the strata of which they are composed were at one time continuous.

DENVER, city, capital of Colorado, and co. seat of Arapahoe county; at the junction of the South Platte river and Cherry creek, and on the Atchison, Topeka and Santa Fé, the Burlington Route, the Chicago, Rock Island and Pacific, the Colorado Eastern, the Denver and Rio Grande, the Denver, Lakewood and Golden, the Denver, Leadville and Gunnison, the Union Pacific, and the Union Pacific, Denver and Gulf railroads; 620 miles w. of Omaha, Neb. It is within 15 miles of the eastern base of the Rocky mountains, and at an altitude of 5,294 feet above sea level. Owing to the remarkable clearness of the atmosphere, a number of the notable peaks of the Rocky mountains are discernible in clear weather, although distant 70 miles and upward. The city is built on a succession of plateaus rising gradually toward the mountains, and has a climate peculiarly mild and adapted to people suffering with pulmonary troubles. Besides the magnificent view of snow-capped mountain peaks on one side, there is a grand stretch of prairie land on the other, and from the latter the city has received the name of the "queen city of the plains." The city has an area of about 45 sq. miles, is laid out regularly with broad streets, and is substantially built, chiefly with brick and stone. In the early days of the city the water supply was from the South Platte river. In 1880 a new system was inaugurated by which water was taken from vertical and horizontal wells constructed along the river, passing by gravity to a reservoir, and thence by direct pumping. In 1886 a new gravity was constructed, supplied from wells in the bed of Cherry creek, and in 1888 a further extension of the water system was undertaken, with the ultimate purpose of obtaining water from the river by gravity. The city is lighted by gas and electricity, has excellent sewerage, and contains many cable and electric street railroad plants. The first building, a trapper's hut, was set up in 1857; a miner's cabin was erected in 1858; a hotel was opened in 1859; the settlement was organized under a city charter in 1859; the first of the trunk line railroads reached the city in 1868; the city was made the capital of the state in 1881; and became a port of delivery in 1882. Among the noteworthy buildings are the capitol on Capitol Hill, 383 feet long and 313 feet wide; the U. S. government building; U. S. branch mint; Denver university (Meth. Epis.); College of the Sacred Heart (Rom. Cath.); Wolfe hall (Prot. Epis.); Jarvis hall military academy (Prot. Epis.); Colorado women's college; Gross medical college; Denver homœopathic medical college and hospital; St. John's college; city hall; chamber of commerce; Denver home for consumptives from the east, built by citizens of New York in 1895; St. John's cathedral (Prot. Epis.); pro-cathedral of the Immaculate Conception (Rom. Cath.); St. Anthony's and St. Joseph's hospitals; Denver Club; and opera-house. There are a number of libraries, including the state, city, public, supreme court, and Y. M. C. A.; over 70 churches; and residences of Methodist Episcopal, Protestant Episcopal, and Roman Catholic bishops. The census of 1890 showed 762 manufacturing establishments, having a combined capital of $16,811,868, employing 10,613 persons, paying $8,377,520 for wages and $14,216,540 for materials, and having an output valued at $29,240,747. The principal plants were several of the largest ore smelting and refining works in the world, lumber and planing mills, flour and grist mills, slaughtering and meat-packing plants, railroad car shops, and foundries and machine shops. In 1894 the town of South Denver was annexed to the city. Pop. '90, 106,713.

DEOBSTRUENTS (Lat. *de*, from, and *obstruo*, I obstruct), medicines which have the property of removing obstructions, especially in the lymphatic system (q. v.). The

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glands of the thorax and abdomen (e. g., the liver, spleen, kidneys, etc.), as well as the lymphatic and lacteal glands, are subject to enlargements, which were formerly, under a mechanical theory of disease, universally ascribed to obstructions of their outlets, or of the vessels in connection with them; against all of these states deobstruents were employed with varying success. The favorite deobstruent remedies are mercury, iodine, and bromine.

DEOBUND or **DEORAND**, a town of India, in the British district of Saharunpore, Northwest Provinces, 20 miles southeast from Saharunpore, on the railway route from Saharunpore to Mozuffurnuggur. It is situated between the rivers Hindun and Kali Nuddee, the one a branch of the Jumna, the other of the Ganges, in an open cultivated country. Pop. '91, 19,300.

DE'ODAND. A personal chattel which was the immediate and accidental occasion of the death of a reasonable creature, was, by the law of England, forfeited to the crown, in order that it might be applied to pious uses, or given to God, as the term implies. The rule did not apply where the instrument had been intentionally used for the purpose of causing death, as in cases of murder and homicide. Blackstone traces the origin of the custom to the church's prayers for the souls of the dead, and asserts that deodands were "designed in the blind days of popery, as an expiation for the souls of such as were snatched away by sudden death; in the same manner as the apparel of a stranger, who was found dead, was applied to purchase masses for the good of his soul." The more probable view is, that it originated in the natural horror which is felt for whatever has been the instrument of so dreadful an occurrence; just like the Jewish law, that if "an ox gore a man that he die, the ox shall be stoned, and his flesh shall not be eaten;" or the old English law, that a well in which a person was drowned should be filled up under the inspection of the coroner. Similar regulations are to be found in the legal systems of most nations. The law of deodand was abolished by statute 9 and 10 Vict. c. 62.

DEODAR. See CEDAR.

DEODAR, a native state in Guzerat, in the Bombay presidency, British India. Its area is estimated at 440 sq. m.

DEO'DORIZERS are chemical substances employed for the purpose of absorbing or destroying the odoriferous principles evolved especially from decomposing animal and vegetable matter. They strictly belong to the classes of substances known as antiseptics) q.v.) and disinfectants (q.v.).

D'ÉON, CHEVALIER. See EON, DE BEAUMONT.

DEONTOLOGY (Gk., *deon*, that which is necessary, fitting, and right, *logos*, discourse, science), the science of that which is morally binding, a name given by Jeremy Bentham (q.v.), to his system of morality, which was based on Dr. Priestley's doctrine that the object of government was "the greatest happiness of the greatest number."

DEOXIDA'TION is the term applied to the process of withdrawing the oxygen from a compound, as in the reduction of the native peroxide of iron in the smelting furnaces to the condition of metallic iron. On the small scale, in experimental inquiries, the process of deoxidation may be carried on before the blow-pipe (q.v.), where the inner or reducing flame is essentially a deoxidizing one.

DEPARTMENT (Fr. *departement*), a term used to denote a territorial division in France. Previous to the revolution, France was divided into provinces; but in 1790 Mirabeau rose in the constituent assembly, and declared that, after having abolished aristocracy, it was neither convenient nor safe to preserve these provincial divisions. He alleged that they were too large, that they tended to concentrate the administrative power in the hands of a few, and that such power soon becomes aristocratic of necessity. He suggested, therefore, a minuter territorial division, as a carrying out of the principles of the revolution. This expression of opinion was followed by a decree of the assembly, dated Feb. 16, 1790, ordering the abolition of the old provincial divisions (34 in number), and the redistribution of the land into 83 departments. During the year 8 of the revolution, these were increased to 98; in 1808 the empire consisted of 127; at the fall of Napoleon, of 130; and at present it consists of 87, including the sadly diminished department of Haut Rhin (from 1871 till 1879 "the territory of Belfort"). Originally, it was intended that the departments should be governed by persons elected by the citizens; but this plan did not suit the views of the first consul, who placed over each department a prefect, and a *conseil de préfecture*. The departments were again subdivided into arrondissements, over each of which was placed a sub-prefect (*sous-préfet*). The right of naming these functionaries was reserved to the chief of the state. This system of departmental administration is still in force in France.

DEPARTMENT is a word used to designate a subdivision of executive government, under the control of a subordinate officer. In the United States, e.g., there are the departments of state, justice, interior, war, navy, treasury, post-office, and agriculture. In some of these departments the work, according to its character, is distributed between different bureaus. The government itself is conducted in three separate departments, each independent in its sphere, viz., the legislative, the judicial, and the executive. The

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country is also subdivided into military departments, each under an officer appointed by authority of the president.

DEPARTURE, a term in navigation, explained under SAILINGS. See also DEAD RECKONING.

DEPAUW UNIVERSITY, at Greencastle, Putnam co., Indiana, a Methodist institution, was organized in 1836 as the Indiana Asbury university, was opened in 1837, and graduated its first class in 1840; was organized as DePauw university in 1884. It has extensive grounds, 8 large buildings, and had, 1897, 35 instructors, 708 students. President, Rev. Hillary A. Gobin, D.D.

DEPEW, a town in Erie co., N. Y., 10 miles e. of Buffalo, laid out and named after Chauncey M. Depew, in 1895. It contains several of the largest shops of the New York Central railroad, and other railroad and manufacturing concerns. Pop. '96, about 2,500.

DEPEW, CHAUNCEY MITCHELL, LL.D., b. Peekskill, N. Y., 1834; lawyer, railroad president, and orator. He graduated at Yale coll., 1856; was admitted to the bar, 1858, and began practice in Peekskill; took part in the political campaign of 1860, and in every one since; was elected to the state assembly in 1861; re-elected 1862; was sec. of the state, 1863; served one year as tax commissioner of New York; was appointed as one of the new capitol commissioners, 1871; was Liberal candidate for lieut.-gov. 1872, but was defeated; was appointed a regent of the university of New York, 1874. He became the counsel of the New York Central & Hudson River railroad company in 1869, and president in 1885. He is popular as an orator and after-dinner speaker, and delivered the orations at the Washington centennial in New York in 1889, and at the dedication of the World's Columbian Exposition in Chicago in 1892.

DE PEYSTER, ARENT SCHUYLER, 1736–1832; an English soldier, native of New York, holding command at Michilimackinac, through whose exertions the Indians very generally sided with the British during the revolutionary war. Late in life he resided in Dumfries, Scotland, and was on terms of friendship with Robert Burns, who was a private in De P.'s regiment of volunteers, and with whom he carried on a poetical controversy in a newspaper. Burns dedicated to him his *Poem on Life*. He was a commissioned officer in the British army for 77 years.

DE PEYSTER, JOHANNES, 1600–85; one of the early settlers of New York, and founder of a noted family. He was a French Huguenot. In New York he filled many offices, including that of mayor.

DE PEYSTER, JOHN WATTS, b. New York, 1821; descendant of Johannes; a writer on military and historical subjects; author of *Life of General Torstenson; The Dutch at the North Pole; The Dutch in Maine; Early Settlement of Acadia by the Dutch; The Dutch in the Battle of the Baltic; History of Carusius; The Ancient, Mediæval, and Modern Netherlanders; Winter Campaigns the Test of Generalship; Practical Strategy; Secession in Switzerland and the United States Compared; Decisive Conflicts of the late Civil War;* etc. De P. was active in introducing a paid fire department in New York. His three sons, J. Watts, jr., Frederick, jr., and Johnston L., were gallant officers of the union army in the war of the secession

DEPHAL, *Artocarpus lakoocha*, a tree of the same genus with the bread-fruit (q.v.) and jack (q.v.), a native of the s. of India, and frequently cultivated in the northern parts of that country. The fruit is eaten, but is inferior to the jack. The juice, like that of the bread-fruit, is tenacious, and is used for bird-lime. The root is used for dyeing yellow. The D. is a large tree, and its timber is valued for a variety of purposes.

DEPHLOGISTICATED AIR. See PHLOGISTON.

DEPILATORIES, or EPILATORIES (Lat. *depilo*, to pull out the hair), are chemical agents employed for removing superfluous hair from the skin. They were extensively used by the ancients, but are now restricted in their employment to the face, and to the removal of the hair from the scalp in the treatment of certain diseases. The caustic alkalies and alkaline earths are generally used, and a good recipe is to mix 5 parts of caustic or slaked lime, 10 parts of carbonate of soda, and 40 parts of lard. The tersulphuret of arsenic (commonly known as orpiment) is occasionally used, but its employment is dangerous, as any abrasion of the skin will enable the arsenical compound to begin to act. A mixture of caustic lime and orpiment constitutes some of the depilatories to be purchased; and it is believed that the Turkish *rusma* is composed of these ingredients. A very active and comparatively safe compound is a strong solution of sulphuret of barium made into a paste with starch, which is immediately applied to the part from which the hair is to be removed, and is allowed to remain for five or ten minutes.

DEPO'NENT, a term in Latin grammar applied to verbs having a passive form but an active signification. They are so called because they, as it were, lay down (Lat. *depono*) or dispense with the signification proper to their form. Such verbs had all originally a reflective meaning, like the middle voice in Greek verbs; thus, *averror*, "I detest," means radically, "I turn myself away from."

DEPOSIT was a real contract of the civil or Roman law. It was the simplest of all contracts, and consisted merely in the delivery of an article by one person to another,

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to be kept without remuneration, and to be restored *in specie* as soon as the depositor should require.—*Inst.* iii. 15, s. 3. Return when required was the sole condition of the contract; and no obligation was incurred by the depositary but to exercise ordinary care in preservation of the article. The civil law recognized a distinction, as to the value which might be recovered by the depositor in case of loss, between the case of articles voluntarily deposited, and those which came into the hands of the depositary by the misfortune of the owner, as by fire or shipwreck. In the latter case, double the value of the article might be recovered. There was also a special provision by the edict *Nautæ, caupones, stabularii*, whereby shipmasters, innkeepers, and stablemen were compelled to exercise more than ordinary vigilance over the goods of their customers and passengers.

The principles of the civil law as to D. have been universally adopted by modern nations. In Scotland, the name of the contract is preserved. Lord Stair, i. 13, 2, lays down that the depositary is "not liable for light faults, or for the perishing or deterioration of the thing deposited by casualty or accident." The article must be restored when demanded, and failure to do this will involve the depositary in liability for the consequences. See also Erksine, iii. 1, 26.

Deposit, in English law, is a branch of bailments, which includes also loans, pledges, and letting and hiring. From each of these, D. is distinct. It is defined by judge Story to be "a bailment of goods, to be kept by the bailee without reward, and delivered according to the object and purpose of the trust."—*Story on Bailments*, c. ii.

The chief questions which have arisen in modern times relate to the amount of care which the depositary is bound to exercise. Judge Story lays down the principle to be, not the care which a man takes of his own affairs, but that which a reasonable being would use, and cites in support of his view the case Doorman *v.* Jenkins, ii. Ad., and Ellis 256, where a person intrusted with money placed it in his own cash-box, and the box having been stolen, the depositary was yet held liable for negligence. So also with jewels or other valuables—the nature of the article implies extra care. Where, however, a sealed packet or locked box is deposited, the question arises as to the liability of the depositary. Erskine lays it down broadly, that where such a deposit is made without showing the contents, the depositary incurs no extra liability. But Story takes a distinction, and states that if the depositary had reasonable ground to believe the contents were valuable, he incurs liability accordingly. The immense value of the timber-trade of America raises in that country questions as to the liability of a landowner for timber left by the river on his ground. On this point, Story indicates that the smallest amount of liability is incurred. Whether or not the depositary may make use of goods left in his charge, is said by the same author to depend on the particular circumstances. If the article would benefit by use, then such use is allowable; but if injury were likely to accrue, it is not. If use is a matter indifferent, then the depositary is not entitled to the use. The admirable work of Story on Bailments is the best authority on this subject.

DEPOSIT, a term much used in geology, to characterize those rocks which have been formed from matter that has settled from suspension in water. The materials constituting such rocks have been obtained by denudation, and their extent in one place equals the denudation in some other. Deposits are characterized according to the conditions under which they were formed, as marine, lacustrine, fluviatile, and so forth.

DEPOSI'TION, the testimony of a witness set down in writing. Depositions are taken either by a judge or by a commissioner specially appointed by him for that purpose. The questions to which the depositions are answers are usually put by the legal representatives of the parties to the suit, under the control of the court or commissioner, and the answers are taken down by the clerk of court, or by a clerk specially appointed for the purpose. If the competency of the questions or the admissibility of the witnesses be objected to, the objection must be stated to the court or commissioner. The latter may either dispose of the objection at the time, or reserve it for the opinion of the court by which he was appointed. It is a rule in the laws of evidence of all countries that the deposition cannot be read where the witness might be himself produced, because his oral testimony is the best evidence, and secondary evidence is never admissible. Where he is dead, however, or insane, or beyond the jurisdiction of the court, his deposition then becomes the best evidence, and may be read in court.

DEPOSITION OF A CLERGYMAN. In Scotland, the minister of a parish who has been guilty either of immoral and scandalous conduct, or of preaching or otherwise publishing doctrines contrary to the standards of the church to which he has declared his adherence, or of contumaciously setting aside the authority of the Presbyterian church-courts, may be deposed from his holy office by the church-courts. By this means he is deprived not only of his ecclesiastical dignity, but of the temporalities of his benefice (stat. 1592, c. 115), and the benefice becomes vacant, just as if he were dead. He may, however, be restored to the exercise of the ministry, and to his position as a minister of the church by the general assembly, but he cannot, of course, be restored to his benefice; and it is considered irregular that he should be so even by a new presentation by the patron, because the stigma attached to his character by his deposition is likely to affect his usefulness. Where sentence of deposition is pronounced by an inferior church-court, the judgment of which is reversed on appeal to the general assembly, it is

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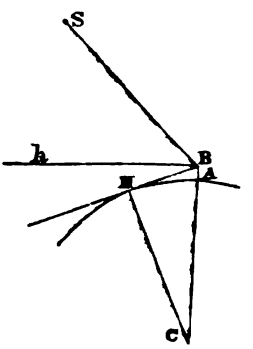
held that it has never been pronounced; but if the sentence be affirmed, it takes effect from the date when it was pronounced by the inferior court, and from that date the minister's right to the profits of his benefice ceases. Sentence of deposition cannot be pronounced by a presbytery in the absence of the minister, except by the authority of the general assembly See DEPRIVATION OF A CLERGYMAN.

DEPOT, in military matters, is a name sometimes given to a place where army stores are deposited during war. In the regimental system, however, a depot used to be the town or barrack where certain stores belonging to the regiment were kept, as well as the regimental books and some of the men, when the regiment was ordered on distant service.

DEPPING, GEORGES BERNARD, 1784–1853; a native of Westphalia, resident of Paris; a writer on a wide range of subjects. Two of his juvenile works attained wonderful popularity: *Winter Evenings*, including the instructions of a father to his children on moral and scientific themes; and *Beauties and Marvels of Nature in France*. He assisted Malte-Brun in his geographical works, and wrote a number of important histories, books of travel, biographies, etc.

DEPRÈS, OR DESPREZ, JOSQUIN, 1440–1521; a French musical composer, of whose life little is known. He was considered by his contemporaries to be the greatest master of his age. Luther was among his admirers. His works consist chiefly of sacred music.

DEPRESSION or DIP OF THE HORIZON is the angle through which the sea-horizon appears depressed in consequence of the elevation of the spectator.



Let A be a point on the surface of the earth, B a point situated in a vertical line from A. Let BH be a tangent to the earth's surface drawn from B, Bh a line in the same vertical plane perpendicular to AB. The angle hBH is the *true* dip of the horizon to a spectator at B.

The true dip measured in minutes is equal to the distance in nautical miles of the visible horizon. Let C. be the center of curvature of the surface; then, since CHB is a right angle, the angle hBH = HCA; and the minutes in this angle are the nautical miles in the arc AH. To find this angle in minutes or nautical miles, the rule is: Multiply the square root of the height in feet by 1.063.

The true dip of the horizon, however, is not exactly the same as its apparent depression. The apparent sea-horizon is raised above its true place by *refraction* through an angle, which varies according to the state of the atmosphere and the relative temperatures of the air and water, the variation ranging from one third to one twenty-third of the amount of the true dip. The rule commonly employed is to diminish the true dip by about one fourteenth of its amount, to find the apparent dip.

If S be a star or the sun in the same vertical plane with ABH, and an observation of the altitude above the sea-horizon be made by means of a sextant from the point B (as from the deck of a vessel), the apparent dip of the horizon must be subtracted from the observed angle, in order to find the altitude of the sun. Owing to the uncertainty of the amount of refraction, the nearest minute to the dip given in the tables is usually taken. The following table gives a sample of the amount of the apparent dip under ordinary state of the atmosphere and equal temperature of air and water. See Raper's *Practice of Navigation*.

Height. Feet.	Dip. m. s.	Height Feet.	Dip. m. s.
0	0 0	8	2 50
1	1 0	9	3 0
2	1 20	10	3 10
3	1 40	20	4 20
4	2 0	30	5 20
5	2 10	40	6 10
6	2 20	50	7 0
7	2 40	100	9 50

DEPRETIS, AGOSTINO, Italian statesman, was born at Stradella, Piedmont, in 1813, and died there, in 1887. He studied and practiced law in Turin, and contributed much towards bringing about the unity of Italy. In 1849 he was civil governor of Brescia, and in 1850 supported the opposition in the Piedmontese Chamber. In 1861 he was appointed pro-dictator of Sicily by Cavour; in 1862, 1866, 1876, 1878, 1879, 1881, he held various portfolios in the cabinet, and several times was prime minister. He became the leader of the opposition after Rattazzi's death, and under his ministry various important reforms were adopted, among which the creation of free ports, and the prohibition of religious processions outside the churches, deserve mention.

DEPREZ, MARCEL, French electrician, b. 1843, invented several mechanical and electrical inventions of value, and was twice appointed chevalier of the Legion of Honor.

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In 1882 it was announced that he had succeeded in transmitting power by a telegraph wire for a distance of 35 miles, between Munich and Miesbach, which is said to have been the first successful experiment in the transmission of electric power to a distance. Further experiments were made on the line of the Northern railway of France. These having proved successful, he became a member of the Academy in 1886. In 1890 he was appointed to the chair of electricity at the Conservatory of Arts and Measures, and also became professor of physics at the college of France.

DEPRIVATION OF A CLERGYMAN. In England this may be either (1) by a sentence declaratory in the proper court, on the ground of attainder or conviction of treason, felony, or any other infamous crime, or of conviction for heresy, infidelity, or gross immorality, or for farming or trading contrary to law, 1 and 2 Vict. c. 106, s. 31; or (2.) in pursuance of divers penal statutes, which declare the benefice void for some nonfeasance or neglect, or else some malfeasance or crime, as simony; for maintaining any doctrine in derogation of the king's supremacy, or of the thirty-nine articles, or the book of common prayer; for neglecting to read the liturgy and articles in the church, and to declare assent to the same, within two months after induction; for using any other form of prayer than the liturgy of the church of England; for continued neglect, after order from the bishop, followed by sequestration, to reside on the benefice. In these latter cases, the benefice is void, without any formal sentence of deprivation (Stephen's *Com.*, iii. 37). A bishop may be deprived of his bishopric, but cannot be deposed, as may be done in the case of a Presbyterian clergyman, the character of a bishop, like that of a priest, being indelible. The tribunal by which the bishop of Clogher was deprived in 1822 consisted of the archbishop and the other bishops of the province; and this precedent having been established, would probably be adhered to on any future occasion, notwithstanding that the archbishop alone might have full authority to deprive.—*Cripps's Laws of the Church*, p. 100.

DE PROFUNDIS ("Out of the depths"), the first words of the 130th psalm, which forms a portion of the liturgy of the Roman Catholic church, and is sung when the bodies of the dead are committed to the grave. A tender melancholy pervades the psalm, which, however, brightens up at the close under the conviction that with God there is "plenteous redemption."

DEPTFORD, a metropolitan parliamentary borough, in the county of London, England. It is situated on the s. bank of the Thames, about 3 m. below London bridge, divided from Greenwich by the river Ravensbourne, a creek of deep water (*deep ford*), formerly fordable at the spot where D. bridge now stands. It contains two parishes, St. Nicholas' and St. Paul's, the latter formed by act of parliament in 1727, and comprising the parliamentary borough. Pop. of D. St. P. '91, 101,300; of D. St. N. 6,900. It contains the royal Deptford victualing-yard, and extensive private shipbuilding and engineering establishments. The site of the old royal dockyard has been occupied by the London cattle market. The market-gardens of Deptford are famous. The upper portion of the town is well built, and is a favorite place of residence for persons engaged in business in London. The ancient incorporation of the master and brethren of the Trinity house of "Deptford Strond," founded by Henry VIII., has its hall at D., and also two sets of almshouses. Queen Elizabeth, in 1581, visited Drake at D., in the ship in which he "compassed the world." In 1698, Peter the Great acquired the art of shipbuilding in the dockyard here, residing at the manor-house of Sayes court, which John Evelyn had previously occupied.

DEPTFORD DOCKYARD, as one of the royal naval establishments, was not so remarkable for shipbuilding as for other operations connected with the fitting out of fleets. Being ill adapted for the large war-ships of the present day, the dockyard proper was abandoned in 1869, and the naval establishment limited to the victualing yard.

DEPUCH ISLAND, a member of the Dampier archipelago, lies off the n.w. coast of Australia, in lat. 20° 38′ s., and long. 117° 44′ east. Though only 8 m. in circuit, yet it is, on more than one ground, worthy of notice. On it have been found some curious specimens of native sculpture; and, rising with its greenstone rocks to a height of 514 ft. above the sea, it presents a remarkable contrast to the low-lying shore of the adjacent mainland.

DEPUTY, one who exercises power which properly belongs to another who has placed him in his stead. The appointment of a deputy does not free the principal from responsibility, for the deputy is not an assignee. It is a general rule, that no judge can appoint a deputy unless he be authorized to do so in the commission by which he himself is appointed. In the rare cases in which a deputy is empowered to appoint a deputy, the latter is usually called a substitute. See SHERIFF.

DEPUTY. See POLITICAL PARTIES, FRENCH.

DE QUINCEY, THOMAS, a distinguished English writer, was b. in Manchester, Aug. 15, 1785. His father was a wealthy Manchester merchant, who, dying while his children were yet young, left his widow a fortune of £1600 a year. De Q. received his first education at home, and was afterwards sent to the grammar school of Bath. He proceeded to the university of Oxford in 1803, and remained there till 1808. At the university, he made the acquaintance of opium, which was ever afterwards his dread familiar. On leaving college, he went to reside at the lakes, and formed one of the

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cluster of literary lights which made that region at the time so illustrious, and afterwards so memorable. He left Cumberland in 1819; and in 1843, he came to reside in Scotland, settling with his family at the village of Lasswade, near Edinburgh. He died at Edinburgh on the 8th Dec., 1859.

With the exception of a strange episode of his youth, described in the *Confessions of an Opium-eater*, the heroine of which was, singularly enough, one of the "waifs of womanhood," De Q.'s career was almost entirely eventless. He led a lonely and a speculative life, and his writings are at once history and autobiography. He was perhaps, with the exception of his friend prof. Wilson, the most brilliant magazine-writer in this century of magazines. Everything he wrote, putting aside the *Confessions*, *The Logic of Political Economy*, and a novel, which no one seems to have read, or, if read, to have remembered, is in the form of articles. Even the *Confessions* themselves were originally published as a series of articles in the *London Magazine*. De Q. has written on a great variety of subjects, and in a great variety of styles. He has written articles pervaded by humor of the most curious and novel kind, philosophical and critical articles distinguished by originality and daring of speculation, and articles of the nature of prose-poems, which are unquestionably of their kind the most wonderful things in English literature. In point of imaginative grandeur, and music and sweep of sentence, the *Suspiria de Profundis*, and the opium visions that close the *Confessions*, are miracles of impassioned prose. De Q.'s works were first collected and republished in America. The edition of De Q.'s works, in 16 vols., published by A. & C. Black, Edin., includes nearly all his writings. See Page's *Life and Writings of De Q.* (1877); Masson's *Sketch* (1881).

DERAH, the Egyptian unit measure of length. The one most in use is 22.37 English in., or 57 centimeters. The derah is divided into the *kadam*, one half; the *abdat*, one sixth; and the *kerat*, one twenty-fourth. The derah by which dry-goods are sold is 25½ in., and the derah of Constantinople is 66.34 inches.

DERAJAT', the fluvial portion of Daman (q.v.), itself a comparatively narrow strip in the Punjab, between the Suliman mountains and the Indus, and which, when duly irrigated, is singularly fertile. D. is so called from *dera*, a camp, a common element in the names of its towns—Dera Deen Punah, Dera Futti Khan, Dera Ghazee Khan, and Dera Ismail Khan. It is divided into the four districts of Dera Ismail Khan, Dera Ghazee Khan, Bannu and Muzaffargarh, and has an area of 22,315 sq. m., and a pop. '91, of 1,644,000. Dera Deen Punah, apparently the least considerable of the above towns, has suffered much from physical causes, having, in 1819, been nearly destroyed by an earthquake and by a simultaneous flood from the Suliman mountains—Dera Futti Khan is the center of a district which produces cotton, grain of various kinds, indigo, sugar, and opium.—The city of Dera Ghazee Khan occupies, for commercial purposes, a very favorable position—the intersection of the two great routes of the country between n. and s., and between e. and w. It manufactures cotton, silk, and steel, and has an extensive bazaar. The district has an area of 5606 sq. m. Pop. '91, 27,900.—The city of Dera Ismail Khan is of modern origin, another town of the same name having been swept away by an inundation of the Indus. It stands on the thoroughfare already mentioned between n. and s., commanding also two ferries across the river. To this position it is indebted for a thriving trade, and in spring particularly it is crowded by the Lohani Afghans, an enterprising tribe of pastoral peddlers. The district has an area of 9,440 sq. m., and a pop. '91 of 486,201.—Besides the towns already described, D. has Isa Khel, and the important commercial town of Leia (q. v.).

DERA'YEH, or DEREY'EEYAH, a t. of Arabia, formerly the capital of the Wahabees. It is situated near the center of Nedjed, 430 m. n.e. from Mecca. It was a town of some consequence before the time of the Wahabees, but attained its highest importance under their dominion. See WAHABIS. It was taken by Ibraham Pasha in 1819, after a siege of seven months, and nearly destroyed. It stands in a valley about half a mile in breadth, filling the whole breadth of the valley, and may probably have at one time contained 40,000 inhabitants, whereas now its pop. is estimated at not more than 15,000.

DERBEND', or DERBENT', a t. of Russia, capital of the government of Daghestan, is situated on the western shore of the Caspian sea, on the declivity of a branch of the Caucasus, which here approaches very close to the water's edge, and forms a defile anciently known as the *Albaniæ Pylæ*, now called the Pass of Derbend. Lat. 42° n., long. 48° 15′ east. D. is built in the form of a parallelogram, being about 3 m. in length, and from a quarter to half a mile in breadth. It is surrounded by strong walls of very ancient date, which are further strengthened at intervals by towers. From two massive iron gates, through which the road to the interior passes, the town derives its name, which signifies "the shut-up gates." The harbor of D. is quite inaccessible to all but small boats. The manufactures of the place consist chiefly of coarse silk and woolen stuffs, and saffron is cultivated. Pop. '91, 11,535. D. is a very ancient place.

DERBY, a city in New Haven co., Conn., at the confluence of the Naugatuck and Housatonic rivers, and on the New York, New Haven and Hartford railroad, 9 miles w. of New Haven; formed in 1893 by the consolidation of the town of Derby and the borough of Birmingham. The town formerly included the town of Ansonia, which was separated from it in 1889. The Housatonic is navigable to this point by vessels

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drawing ten feet of water. The manufactures include articles of iron, bronze, and brass, pins, hosiery, typewriting machines, pianos and organs, mantels, etc. Pop. '80 (including Ansonia), 11,650; '90, including Birmingham (4413), 5969.

DERBY, a parliamentary and muncipal borough and manufacturing town, the capital of Derbyshire, in the s. part of the co., in the wide and fertile valley of the Derwent—thence navigable to the Trent—at the junction of the main branches of the Midland railway, 132 m. n.n.w. of London, and 55 m. n.n.e. of Birmingham. The houses are mostly of brick, and the public buildings of stone. The free grammar school is one of the oldest English foundations, reaching to 1162. Here Blackwell, author of the *Sacred Classics*, was a master, and Flamsteed a pupil. Dr. Darwin, in 1783, founded the philosophical society of D., and wrote most of his works here. D. is well situated for manufacture and trade, being at the s. end of a coal-field, and being connected by canals and railways with a great part of England. It has manufactures of silk, cotton, lace, hosiery, porcelain, etc., and extensive engineering works. The staple manufacture is throwing silk, introduced by Mr. Crochet from Italy early in the 18th c.; the silk-mill erected in 1718, by John Lombe, being the first and largest of the kind in England. The building stood till 1890. The population of the municipal borough was estimated in 1896 at 101,770. D. returns two members to Parliament. In 1867 a new cattle-market, on a very complete scale, was opened, and also a new corn-exchange. The grammar-school was removed in 1862 from St. Peter's churchyard to St. Helen's house, the site of the original foundation; and a large handsome market-hall was completed in 1866. In 1867 Mr. M. T. Bass, for nearly forty years one of the members of parliament for D., presented the town with six acres of recreation ground; and a new wing was added to the general infirmary. D. was the Roman station *Derventio*, which stood on the e. bank of the river, opposite the town. Roman brass, silver, and gold coins have been found, a Roman pavement, and the foundations of a Roman bridge. D.—called *Northworthige* by the Saxons, and *Deoraby* by the Danes—was given by the conqueror to William Peveril.

DERBY, the titular name of a distinguished family of the British aristocracy, descended from a common family with the barons Audley or Audleigh, co. Stafford. William de Audleigh, on exchanging with his cousin, sir Adam de Audleigh, the manor of Talk, co. Stafford, for that of Stanleigh (Stony Lea), co. Derby, adopted the latter name, and continued it to all his descendants. This event occurred in the 12th century. The first who assumed the arms now used by the family—viz., "three stags' heads on a bend"—was sir William de Stanley, son of William de Stanley, who flourished in the reign of Henry III. The first Lord Stanley was created in 1456; his eldest son Thomas was created first earl of D. in 1485.

DERBY, Edward Geoffrey Smith-Stanley, 14th Earl of, was b. 1799, at Knowsley Park, Lancashire. He was educated at Eton and Christ-church, where, in 1819, he gained the Latin verse prize (subject, *Syracuse*). He was elected member of parliament for Stockbridge in 1820; in 1825, he married the second daughter of the first lord Skelmersdale; and in 1826, he represented Preston, but lost his seat in 1830, on becoming chief secretary for Ireland under the administration of earl Grey. A seat was then found for him at Windsor. He took a distinguished part in the debates in favor of the reform bill, and signalized his Irish administration by two bold measures—one for national education in Ireland, and another relative to the Irish church temporalities, which resulted in ten Irish bishoprics being abolished. The grievance of church-rates and first-fruits was also removed, and a graduated tax upon benefices and bishoprics substituted. In 1833, he became secretary of state for the colonies, and in the same year carried the bill for emancipating slaves in the West Indies, and providing a compensation of twenty millions to the planters. In 1834, being alarmed by the success of Mr. Ward's motion for appropriating the surplus of the Irish church temporalities to secular purposes, lord Stanley seceded from the Grey ministry, carrying with him sir James Graham, the duke of Richmond, and the earl of Ripon. He ever afterwards adhered to the conservative party, although, in 1834, upon the dismissal of the Melbourne ministry by William IV., he declined to join the administration of sir Robert Peel. After acting in concert with the opposition for seven years, he accepted the colonial seals in the Peel administration of 1841, and held them for four years. In Sept., 1844, he resigned his seat for north Lancashire, for which he had sat since 1832, and was called to the upper house in his father's barony of Stanley of Bickerstaffe. In Dec., 1845, when sir Robert Peel determined to repeal the corn laws, he retired from the cabinet. In 1846, he put himself at the head of the protectionist opposition, which, headed in the commons by lord George Bentinck and Mr. Disraeli, waged a stout but ineffectual opposition to the free-trade measures of sir Robert Peel. He was now regarded as the leader of the great conservative party. In 1851, on the death of his father, he succeeded to the earldom. In Feb., 1852, on the resignation of lord John Russell, he was sent for by the queen, and intrusted with the formation of an administration, which was, however, displaced in Dec. following by a hostile vote of the house of commons condemnatory of the budget of his chancellor of the exchequer, Mr. Disraeli. On the death of the duke of Wellington in 1852, he was elected to the post of chancellor of the university of Oxford. In Feb., 1858, when the Palmerston gov.

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ernment resigned on the rejection of the conspiracy bill, he again became first lord of the treasury. At the meeting of parliament in the following year, his government brought forward a measure of parliamentary reform. A hostile amendment having been moved by lord John Russell, and carried, he dissolved parliament, and appealed to the country. When the new house of commons reassembled in June, 1859, a vote of want of confidence was carried against his government, and he resigned. He returned to power in 1866, and, in conjunction with Mr. Disraeli, passed the reform measure of 1867. See REFORM. In 1868, he resigned the premiership in favor of Mr. Disraeli. His last speech in parliament was made (1869) in opposition to the disestablishment of the Irish church. He died Oct. 23, 1869, and was succeeded in the earldom by his son, Edward Henry Smith-Stanley (see STANLEY). As a debater, the late earl stood in the very first rank. His power of invective was almost unequaled, and his vehement contentions with O'Connell on the repeal of the union and the Irish church did much to diminish the influence of the Irish agitator. He was tall, of commanding gesture, and his voice, in elevated passages of declamation, rang with power and effect. D. devoted the leisure of his latter years to translating Homer's *Iliad*, which was published in two volumes in 1864, in blank verse.

DERBY DAY is the second day, the Wednesday, of the grand spring meeting, which takes place at Epsom in England, in May, in the week succeeding Trinity Sunday. Upon this day, the most important on the list, and that on which the best horses run, the famous Derby stakes, instituted by the earl of Derby in 1780, and which consist of 50 sovereigns each, are contended for. When the first Derby was run for, there were only 36 subscribers at 50 guineas each (with £25 forfeit in case of non-starters); but the number of subscribers is now so large, that the value of the stakes sometimes amounts to more than £6,000. The Derby Day is the great English holiday. To be present at Epsom on that occasion, London empties itself, and proceeds to the Downs by modes of locomotion the most heterogeneous. For hours, a continuous stream of carriages, gigs, dog-carts, vans, and vehicles of every description, moves tumultuously along the road to Epsom. Shopkeepers on that day shut up their shops, the benches of parliament are deserted, one half of the aristocracy appear on the ground, people of every condition arrive in countless numbers from all districts; and huge trains arrive every few minutes at the station, bringing their thousands, until the entire Downs are covered with a vast moving mass. So great is the demand for conveyances on this day, that scarcely a horse can be had either in London or within 40 m. of it. At the Derby in 1861, the course, which is a mile and a half in length, was gone over in 2 minutes 42 seconds—the swiftest running, by 2 seconds, ever yet known on that course.

DER'BYITES. See PLYMOUTH BRETHREN.

DERBYSHIRE, an inland co. of England, lying between Yorkshire on the n. and Leicestershire on the south. Its shape is triangular; the greatest length from n. to s. being 56 m.; greatest breadth, 34; area, 1030 sq. miles. The north-west is occupied by the s. end of the Pennine chain, called the High peak or Derbyshire highlands. This tract forms the water-shed between the Trent and Mersey, and is not surpassed for rugged and romantic scenery by anything in England; abounding in precipices, fruits, rocking-stones, caverns—one of which is 2,700 ft. long—and streams that often lose themselves for a time among the fissures of the limestone hills. The peak, the loftiest hill in D., is 2,000 ft. high. From the peak tract, a range runs s.; another runs 20 m. s.s.e. Other ranges intersect parts of the co. To the s., D. sinks into a flat or gently undulating tract of new red sandstone, with some spots of magnesian limestone and coal, and beds of red marl and gypsum. The chief rivers are the Trent—dividing D. from Staffordshire for 10 m., and then crossing the s. of the co. and passing into Nottingham—and its tributaries, the Derwent and the Dove, both of which rise in the region of the peak, and flow in a south-easterly direction. Warm mineral springs exist at Buxton and Matlock, and intermitting springs at Barmoor and Tideswell. D. is celebrated for metals and minerals—iron, lead, zinc, manganese, copper, coal, fuller's-earth, mineral caoutchouc and mineral oil, gypsum, pipe-clay and chert for potteries, marble, fluor-spar, and alabaster for ornaments, etc. D. has six canals, and is intersected by many branches of the Midland railway. In the n., the climate is cool and moist, with fogs, and often frosts in summer. D. is more a manufacturing and mining than an agricultural county. The best soils in the s. are red, marly, fertile loams. There are many woods and coppices. The chief crops are wheat, barley, and oats. D. has much permanent pasture, large dairies, and sheep-pasturage in the Peak district. There are manufactures of cotton, silk, worsted, metallic goods, porcelain, and marble and spar ornaments. The county is traversed by the branches of the Midland railway and other lines. In 1894 an important line was opened across the northern part of the county. The chief towns are Derby, Ashbourne, Bakewell, Buxton, Chapel-en-le-Frith, Chesterfield, Belper, and Wirksworth. In 1891 the pop. was 528,083. D. contains five parliamentary divisions. There are in the co. remains of so-called Druid circles, barrows, cromlechs, British and Roman roads, Roman baths, and a Roman altar at Haddon hall. There are also ecclesiastical and monastic remains. Repton church crypt is older than 874. Hardwick hall contains some furniture of Elizabeth's time, and some embroidery said to have been done by Mary Queen of Scots. Near Bakewell is Chatsworth the

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magnificent seat of the duke of Devonshire. Arkwright built his first mill at Cromford, in 1771.

DERBYSHIRE NECK. See GOITER.

DERBYSHIRE SPAR is a name given to the fluoride of calcium, or fluor-spar (q.v.)

DERECSKÉ, a t. of Hungary, 12 m. s. of Drebreczin. It is situated in the vicinity of several small lakes, from which, in the summer time, a considerable quantity of soda is obtained by evaporation. In one of the lakes, small but very beautiful pearls are found. Pop. '90, 8272.

DEREHAM, EAST, a t. in the middle of the co. of Norfolk, 16 m. w.n.w. of Norwich. Its streets are wide, well lighted, and well paved. The church, which is cruciform, with a tower, contains the remains and monument of Cowper the poet. D. has manufactures of agricultural machines, and in the highly cultivated country around, there are many gardens and orchards. Pop. between 5000 and 6000. Here Withburga, daughter of king Anna, founded a nunnery in the 7th c., which was burned by the Danes, and afterwards refounded. Withburga was buried in her nunnery in 654, but her remains were stolen thence by the monks of Ely in 974.

DERELICT, a term in English law, signifying anything forsaken or left, or willfully cast away. Derelict lands, if suddenly left by the sea, belong to the crown; but if the sea has receded gradually and imperceptibly, the gain will go to the owner of the adjacent lands.

In order to constitute a ship which has been wrecked derelict, it is necessary that the master and crew shall have abandoned her, without hope of recovery. The mere quitting of a ship for the purpose of procuring assistance from the shore, or other temporary cause, with the intention of returning to her again, is not an abandonment. See Lord Stowell's judgment in the case of the *Aquila* (1 Rob. 37), and *Abbot on Shipping*, p 489. When such abandonment or dereliction has occurred, the first-comers are entitled to take temporary possession of the ship, and to claim salvage, either from the owners, the lord of the manor, or other person having right to wrecks unclaimed by the owners, or in the event of no claim from the crown. The general superintendence of all matters relating to wreck is placed in the board of trade by the 439th section of 17 and 18 Vict. c. 104, commonly called "the Merchant Shipping act;" and the board may, with the consent of the commissioners of her majesty's treasury, appoint any officer of customs, or of the coast-guard, or other person, to be a receiver of wreck in any district, and to perform the duties imposed on him by the act. These duties consist in taking the command of the persons present, and availing himself of their services to the best of his ability to save the ship and her crew and cargo. If any one refuses to obey him, he shall incur a penalty of £50; and if any master of a ship or boat shall refuse him his aid, or any proprietor of a wagon, cart, or horses shall refuse him the use of them, he shall incur a penalty of £100. All articles washed on shore or lost are to be delivered to the receiver, and he has power to suppress plunder and disorder by force. Within 48 hours after taking possession of any wreck, the receiver shall cause to be posted up in the nearest custom-house a description of the same, and of any marks by which it is distinguished; and if the value of such wreck exceeds £20, he shall transmit a similar description to the secretary of the committee of Lloyd's (s. 452). See LLOYD'S. Goods deemed perishable he may sell immediately (s. 453). The owner of all wreck is entitled, within one year, to claim it from the receiver, who will deliver it up to him on receiving payment of such expenses, fees, and salvage as may have been incurred in terms of the act (s. 470). In the event of no owner establishing his claim before the expiration of a year from the date at which the wreck has come into the possession of the receiver, it shall be delivered up to the lord of the manor or other person having title to it. If a dispute arise as to the property of wreck, or the amount of salvage or other charge due, it may be decided by two justices, whose proceedings may be reviewed by any court of law or equity, if carried there by appeal within three months. If no claim shall be established to wreck either by an owner or lord of the manor, or admiral, mayor, or other person having title to wrecks cast on shore at particular parts of the coast, the wreck becomes the property of the crown, and shall be sold by the receiver, and the proceeds, after deducting fees and expenses, paid into her Majesty's exchequer (s. 475).

The principle upon which Salvage (q. v.) is given on wrecks and derelict is, that a person who by his labor preserves goods which the owner or those intrusted with the care of them have either abandoned in distress at sea, or are unable to protect and secure, is entitled to retain the possession of the goods until proper compensation is made to him for his trouble. Where the parties cannot agree on this sum, and are unwilling to adopt the decision of the justices, as above stated, the amount is generally ascertained by a jury. Till the question is decided, the goods remain in the custody of the salvor, or of the receiver for his behoof. No claim for salvage is due where the owner, or those in his employment, are at hand on the coast, and in a condition to save and protect his property. If any one set of persons have taken possession of a derelict, and are endeavoring to bring it into port and save it, another set have no right to interfere with them and become participators in the salvage; unless it appears that the first in possession would not have been able to effect the rescue of the property without the aid of the others (Abbot, p. 490). This rule applies to king's officers, even where the property

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saved is government stores. The original salvors cannot be dispossessed without reasonable cause. As to the proportion which the salvage allowed bears to the value of the property saved in various circumstances see SALVAGE.

DERG, LOUGH (signifying the *red lake*), the name of two Irish lakes. One, the largest lake expansion of the river Shannon, between Tipperary on the s.e., and Galway and Clare on the n.w., is 24 m. long from n.e. to s.w., 2 to 6 broad, 10 to 20 ft. deep at the upper, and 50 to 80 at the lower end. Its surface is about 100 ft. above the sea. It contains several islands.—The other Lough Derg is in the s. of Donegal county, on the borders of Tyrone. It is 3 m. by 2½, has many small isles and rocks, and wild dreary shores, and is surrounded by mica-slate hills 700 to 1200 ft. high. Saint's Isle contains the remains of a priory, founded about 600, and is the original seat of St. Patrick's purgatory. But the place of penance has for some centuries been on Station Isle—under an acre in extent, and with two chapels—for many years the most celebrated place of pilgrimage in Ireland, thousands of persons flocking to it annually, for prayer, fasting, and vigils.

DERIVA'TION. See ETYMOLOGY.

DERIVATION, in Medicine, a method of curing disease, by which it was formerly supposed that the *materies morbi*, or matter of the disease, was drained away through some channel established for it by artificial means, as when a blister is applied over an inflamed lung, or a discharge from the bowels established in a case of dropsy. Without too closely scrutinizing the theory, it may be admitted that many of the practices founded on it have also a pretty firm basis of experience, and are well established in modern medicine.

DERMATOLOGY (Gr. *dermatos*, of the skin, *logos*, a discourse), the science of the management of the skin and of its diseases. See SKIN.

DERMATOPHYTES (Gr. *derma*, the skin, and *phyton*, a growth or plant), vegetable growths, chiefly of the lowest of Cryptogamia (q. v.), inhabiting the cuticle or epidermis, and giving rise to some forms of skin-disease, as Favus (q. v.), Pityriasis (q. v.), Ringworm (q. v.), etc.

DERMESTES, a genus of coleopterous insects of the section *pentamera*, and of the family *clavicornes* (q.v.); having antennæ shorter than the thorax, their three terminal joints forming an ovate compressed club. Their larvæ feed mostly on dry and decaying animal matter, and are very voracious, committing great ravages among furs, collections of natural history, etc. *D. lardarius* is the well-known BACON BEETLE, the larva of which is so often destructive to bacon and other dried meats, and often also to cheese. The perfect insect is about a quarter of an inch in length, and of a dull black color, the base of each wing-cover ash-colored with three black spots. The larva is of a long shape, tapering towards the tail, dark-brown above, white beneath, with long hairs, and furnished with two horny hooks on the last segment. The larva of *D. murinus* is common in the dried carcasses of vermin nailed up on doors by gamekeepers; that of *D. vulpinus* abounds among cargoes of hides brought from warm climates; that of *D. paniceus* in long-kept stores of ship-biscuits.

Use is sometimes made of the larvæ of species of D. for procuring well-cleaned skeletons of birds and other small animals: the animal is first soaked in water, to get all the blood out; then dried, to suit it to the taste of the larvæ, which are placed with it in a covered box; and in a short time their work is very neatly and completely done, much better than by ants.

DERMIS. See SKIN.

DERMOPTEROUS (Gr. skin-finned) **FISHES**, an order of fishes in Owen's classification, so named from the cutaneous vertical fins, in which the rays are extremely soft and delicate, or altogether imperceptible, and further characterized by the want of pectoral and ventral fins. Lampreys, the lancelet, etc., are dermopterous fishes.

DERMO-SKEL'ETON, a term applied to the coriaceous, crustaceous, or osseous integument that covers most invertebrate and some vertebrate animals. It serves as a protection for the soft parts of the body.

DERNA, or DERNAH, a t. of Tripoli, northern Africa, situated at the mouth of a ravine a mile from the Mediterranean, in about lat. 33° 30′ n., long. 22° 30′ east. Built on both sides of a ravine, it has regular streets, which are far from cleanly.

DÉROULÈDE, PAUL, French author, a nephew of Émile Augier, was born in Paris, Sep. 2d, 1848. He engaged in the study of law, and when war broke out in 1870, served as a volunteer. He owes his reputation to his volumes of poems, *Les Chants d'un Soldat* (1872), and *Nouveaux Chants d'un Soldat* (1875), which are intensely patriotic in tone. He has written also the dramas *Juan Strenner* (1869), and *L'Hetman* (1877). Déroulède has been decorated with the Legion of Honor. He was for a time an enthusiastic supporter of General Boulanger (q.v.), but after the revelation made in 1890, was less prominent as an agitator.

DERRICK, a mechanical contrivance used for the same purpose as the crane, but recently so improved in size, strength, and mechanism, as to be able not only to raise a body of 1000 tons in weight, but to transport it from one place to another. The fol-

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lowing description of the *Great Floating Derrick*, built in 1859, will convey an idea of the powers of this machine, and of the principles upon which it works. This derrick was built by the Thames Iron Ship-Building Company, at Blackwall. It consists of a flat-bottomed vessel, 270 ft. long, and 90 ft. across the beam, and is divided throughout into a number of water-tight compartments, which can be filled, so as to counterbalance any weight on an opposite side. From the deck of this floating steam-crane rises an iron tripod 80 ft. high, on the top of which revolves a gigantic boom, 120 ft. long, and above the boom the "king-post," a continuation of the tripod, rises to the height of 50 feet. One arm of the boom is furnished with ten fourfold blocks; the chains attached to these blocks are passed across the king-post, brought over the other arm of the boom, and so descend to the other side of the vessel, where they are connected with two powerful steam-engines, by means of which the weights are raised. This derrick is capable of being propelled by means of a series of bucket-paddle floats at the rate of 4 miles an hour. It is the invention of Mr. Bishop, an American.

DERRINGER, a kind of short-barreled pistol, of very large calibre, very effective at short range. It derives its name from its inventor, an American gunsmith.

DERRY. See LONDONDERRY.

DERVISH is a Persian word signifying *poor*, corresponding to the Arabic *Fakir* (q.v.). It designates, in Mohammedan countries, a class of persons resembling in many respects the monks of Christendom. The dervishes are divided into many different brotherhoods and orders. They live mostly in well-endowed convents, called Tekkije or Changah, and are under a chief with the title of a Sheik, i.e., "elder." Some of the monks are married, and allowed to live out of the monastery, but must sleep there some nights weekly, Their devotional exercises consist in meetings for worship, prayers, religious dances, and mortifications. As the convent does not provide them with clothing, they are obliged to work more or less.

It is difficult to say when these religious orders took their rise. From the earliest times, pious persons in the east have held it to be meritorious to renounce earthly joys, to free themselves from the trammels of domestic and social life, and to devote their thoughts in poverty and retirement to the contemplation of God. In this sense, poverty is recommended by Mohammed in the Koran. Tradition refers the origin of these orders to the earliest times of Islam, making the caliphs Abubekr and Ali found such brotherhoods; but it is more probable that they arose later. Many Mohammedan princes and Turkish sultans have held dervishes in high respect, and bestowed rich endowments on their establishments; and they are still in high veneration with the people. The orders are generally named after their founders, and the best known are the *Bestamis*, established 874 A.D.; *Kadris*, 1165; *Rufaji*, 1182; *Mevelevis*, 1273; *Naksh-bendis*, 1319; *Bektashis*, 1357; *Rushenis*, 1533; *Shemsis*, 1601; and *Jemalis*, 1750.

DERWENT, one of the principal rivers of Tasmania, issues from lake St. Clare, in the center of the island; flows tortuously towards the s.e.; waters Hobart-Town, the capital; and enters Storm bay, in D'Entrecasteaux channel, by an estuary of 4 m. in width. Up to Hobart-Town, the D. is navigable for ships of any burden. The lat. and long. of the mouth are about 42° 53′ s., and 147° 25′ east.

DERWENTWATER, or KESWICK LAKE, an oval sheet of water in the s. of Cumberland, and one of the most beautiful of the lakes of that county. It stretches s. from Keswick, is 3 m. long by 1½ broad, 72 ft. deep, and 222 ft. above the sea. Its banks are rocky and abrupt, and behind them rise rocky mountains, one of which, the Cat Bells, is 1448 ft. high, and another, Lowdore, has a fall of 100 feet. This lake is an enlargement of the Derwent river, which runs through the lake in its course towards the Irish sea, into which it flows at Workington. It has several wooded isles, besides a remarkable floating isle—a mass of earthy matter 6 ft. thick, and varying in size in different years from an acre to a few perches, covered with vegetation, and full of air-bubbles, which buoy it on the surface of the water. D. abounds in trout, pike, perch, and eels.

DERWENTWATER, JAMES, Earl of, one of the leaders in the rebellion of 1715, and the last earl of D., was the descendant of an ancient Northumberland family named Radcliffe. He was b. in 1689, educated in France, and on the death of his father in 1705, D., then in his 17th year, returned to the seat of his ancestors at Dilston, in Northumberland, and assumed the paternal titles and estates. On the eve of the insurrection, at the close of 1714, warrants were issued on suspicion against several gentlemen in the n. of England, and one, among others, against the earl of D.; but having been previously warned, he fled from Dilston, and found refuge in the cottage of one of his dependents. He soon afterwards collected a few retainers, and placed himself at their head, under the impression that the entire body of the Jacobites either had risen or were about to rise. From this period the history of the earl of D. becomes the history of the rebellion of 1715, which ended in the disastrous encounter at Preston, on which occasion D. conducted himself with the utmost heroism, but, with the most of the rebel leaders, was taken prisoner, and conveyed to the tower of London. Having been impeached of high treason at the opening of parliament, he was carried before the house of lords, Feb. 9, 1716, and, requesting time to prepare an answer to his accusation, was

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remitted till the 19th, when, being taken for trial to Westminster hall, he pleaded guilty, and threw himself upon the mercy of the king. His appeal was unavailing, and he was condemned to suffer. Every possible effort was made by the relations and friends of D. to obtain a pardon, but their exertions were fruitless, and he was beheaded on Tower hill, 24th Feb., 1716 His youth, his invariable amiability of temper, his rank, and his bravery, combined to excite great sympathy for the unhappy sufferer.

DERZA'WIN, GABRIEL ROMANOWICZ, a celebrated Russian lyric poet, was b. at Kasan, 3d July, 1743, studied at the gymnasium of his native city, and in 1762 entered the army as a private soldier. His talents and superior education soon procured him promotion. The empress Catharine highly esteemed him; and in 1791, appointed him secretary of state; in 1800, imperial treasurer; and in 1802, minister of justice. This last office, however, he held for only one year, when he retired on a pension, and devoted the remainder of his life wholly to the muses. He died 6th July, 1816. D. is a thoroughly original poet. He excels in loftiness of idea, purity of sentiment, and rich vigor of language; in fact, the latter quality at times manifests itself in an oriental extravagance of imagery which the colder fancy of the west fails to appreciate. D.'s noblest as well as his most popular ode is his *Address to the Deity*. It has been translated into English, German, and other European languages. His collected works were first published at St. Petersburg in 5 vols. (1810–1815), and have been often reprinted since.

DESAGUADE'RO, the name of various waters in Spanish America, of which the chief are a lake and two rivers.—1. The lake, situated in Araucania (q.v.), measures 35 m. in length, with an average breadth of 5, and sends forth the Osorno to the Pacific.—2. A river of the Argentine confederation, separates the departments of San Luis and Mendoza. It is, however, merely a winter torrent, being quite dried up in summer.—3. A river of Bolivia—the only stream of any magnitude that is wholly within its borders—issues from lake Titicaca, and, after a s. course of 190 m., loses itself in the land-locked lake of Aullagas, near the town of Oruro. It is, without exception, the loftiest stream of any length on either continent, for the elevation of its source, not greatly exceeding that of its mouth, is 12,846 ft., or nearly 2½ miles.

DESAGUADE'RO, a great plain between the e. and w. branches of the Bolivian Andes, two thirds of it in Bolivia and one third in Peru, about 400 m. long by 30 to 80 m. wide. This plain is 13,500 ft. above the sea. The region is rich in silver, copper, and tin, and there are probably other minerals. Thermal springs are a feature also. There are but two seasons, dry and wet, answering to summer and winter. Not a tree is to be seen. The lower valleys are covered with luxuriant grass, and afford excellent pasturage. Grain is not cultivated. Potatoes grow wild. The Indians make huts, boats, mats, and other articles of convenience, from native rushes. Cattle, horses, asses, and mules are plentiful. The most important animals are the guanaco, and the allied genera of alpacas, llamas, and vicunas, all yielding valuable wool. Oruru is the most important town.

DESAIX DE VEYGOUX, LOUIS CHARLES ANTOINE, a general of the first French republic, was born at St. Hilaire-d'Ayat, in Auvergne, Aug. 17, 1768. After studying at the military school of Effiat, he was appointed in 1792 aid-de-camp to prince Victor de Broglie, then at the head of the army of the Rhine. Here D. distinguished himself by his bravery, which was at the same time cool and fearless. In 1796, Moreau, having obtained the command of the army of the Rhine, made D. his lieutenant, and employed him in the most difficult and dangerous missions. In Moreau's (q.v.) famous retreat through the Black Forest during this year, D., who commanded the left wing of the army of the Rhine, increased his already great reputation. The French by this retreat had now retired within the Rhine, retaining on the right bank only the fort of Kehl, which D. was commissioned to defend. The fort was in ruins, and could not be well repaired before the approach of the Austrians; nevertheless, behind this imperfect defense D. resisted the Austrian army for more than two months, only capitulating in Jan., 1797, when his ammunition was spent. His greatest achievement, however, was the conquest of Upper Egypt, which he accomplished in 1799, after an eight months' campaign. He was incredibly fertile in resources, and possessed the power of winning and restraining the people whom he had conquered to a wonderful degree; his own soldiers used to compare him to Bayard, while the inhabitants named him *The Just Sultan*. D. returned from Egypt just in time to take part in the battle of Marengo, on the 14th June, 1800, in which he was killed by a musket-bullet. His body was placed—after being embalmed—in the convent of Mt. St. Bernard. A statue has been raised in his honor in the Place Dauphine, in Paris.

DE SANCTIS, LUIGI, 1808–69; an instigator of the Protestant movement in Italy, for several years a Roman Catholic professor of theology. In 1847, he established a Protestant journal, the *Eco del Veritè;* in 1868, he accepted the professorship of theology in the Waldensian seminary at Florence.

DÉSAUGIERS, MARC ANTOINE MADELEINE, 1772–1827; a French dramatist and composer of songs; author of many dramas, including comedies, operas, and vaudevilles, produced in rapid succession. His singing of his own songs made his company

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greatly sought after. Late in life he undertook theatrical management, but with no great success.

DESAULT, PIERRE JOSEPH, 1774–95; a French anatomist and surgeon, who, when but 20 years of age, opened a school in Paris, where his success excited the wonder and jealousy of the established professors. In 1776, he was admitted a member of the incorporation of surgeons, and successively held other positions of honor. In 1782, he was appointed surgeon-major to the *De la Charité* hospital, and came to be regarded as one of the first surgeons of the age He next went to the hôtel Dieu, and after Moreau's death the surgical department of the hospital was intrusted to him. There he instituted a clinical school for surgery, and attracted pupils from all countries, often having audiences of 600; and most of the surgeons of the period derived their knowledge in great part from his lectures. He introduced many improvements in the practice and in surgical instruments. During the revolution he suffered undeserved persecution, but was afterwards restored to favor.

DES BARRES, JOSEPH FREDERICK WALLET, 1722–1824; an English scientist; descendant of a Huguenot family which fled from France to England. He graduated from the royal military academy at Woolwich, and was sent to America as a lieut., where he was engaged in the French and Indian war. He was in the expedition against Louisburg, and in the siege of Quebec was aid to Wolfe, who fell into his arms when he received his death-wound. For some years afterwards Des Barres was charged with important engineering surveys in Nova Scotia, Newfoundland, and other British colonies, with a view of establishing a chain of military posts. He was also engaged in correcting old and making new charts of the North American coast, which were published in 1777, under the title of the *Atlantic Neptune.* In 1784, he became governor of the island of Cape Breton, and soon afterwards began to build the town of Sydney, where he opened the coal trade. In 1804, at the age of 82, he was made lieutenant-governor and commander-in-chief of Prince Edward's Island. He lived to be 102 years old.

DESCANT, or DISCANT (Sp. *discante*), a term which, in ancient times, was given to a musical composition; also to the counterpoint or melody which the singer (taking the upper part) sung extempore to the tenor or bass. In modern music, the term is applied to the part written for the voices of females or boys, and is the same as treble or soprano.

DESCARTES, RENÉ (Latinized into RENATUS CARTESIUS), the name of one of the reformers of philosophy, was b. Mar. 31, 1596, at La Haye, in Touraine. He was sent at the age of 8 years to the Jesuit college at La Flèche, where he soon became distinguished for his keenness of intellect, and made great and rapid progress in languages, mathematics, and astronomy. It was not long, however, before he became dissatisfied with the doctrines and method of scholasticism, and felt it impossible to acquiesce in what had hithero been regarded as *knowledge.* The first thing that he did after leaving college, as we are informed in his treatise on method, was to abandon books, and endeavor to efface from his mind all that he had hitherto been taught, that it might be free to receive the impressions of truth, whencesoever they should come. In pursuance of his plan, he resolved to travel, and soon entered the army as a volunteer, serving successively in Holland and Bavaria. As, however, the life of a soldier contributed little to his main object, he quitted the army in 1621; and after making journeys in different directions, he at last retired to Holland, where he prepared most of his works, attracted many disciples, and at the same time became involved in several learned controversies, especially with the theologians. Although he loved independence, yet, in 1649, he accepted an invitation to go to Sweden, addressed to him by queen Christina, who desired his learned intercourse and instruction. His willingness to leave Holland was partly occasioned by his anxiety to escape from the hostility of his enemies. Only a few months after his arrival at the court of queen Christina, he died on Feb. 11, 1650. Sixteen years later, his body was brought to Paris, and buried in the church of St. Genevieve-du-Mont.

The grand object towards which D. directed his endeavors, was the attainment of a firm philosophical conviction. The way whereby he sought to attain this end, is explained in the discourse on method (*Discours de la Méthode,* published in 1637), to which we have already referred. This small, but extremely interesting and important treatise, contains a history of the inner life of the author, tracing the progress of his mental development from its commencement in early years, to the point where it resulted in his resolution to hold nothing for true until he had ascertained the grounds of certitude. The author also, in the same treatise, explains the practical rules whereby he resolved to be guided while in this state of *suspended belief,* and by the observance of which he hoped to arrive at *absolute certainty,* if, indeed, it were at all attainable. The results of his inquiries, so conducted, he exhibited more particularly in his *Meditationes de Primâ Philosophiâ* (Amst. 1641), and the *Principia Philosophiæ* (Amst. 1644). In the former of these treatises, the independence of his thinking is strikingly brought out by his commencing his Meditations with the expression of doubt with regard to all that had hitherto borne the name of knowledge. After examining thoroughly, as he thought, the grounds of certitude in the various departments of knowledge, he found one, and only one, proposition that seemed to him to stand the test, and of which the truth could not possibly be doubted: that proposition was, that he existed, which he inferred from the fact of his possessing consciousness. He could not doubt that he felt and thought,

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and therefore he could not doubt that *he*, the feeler, the thinker, existed. This relation between consciousness and existence he expressed by the memorable words: *Cogito, ergo sum.* Instead, however, of making the above proposition the foundation of his philosophy, by which he would have been led into a direction similar to that of Kant or Fichte, he employed it only so far as to ascertain from it the criterion of certitude—viz., that whatever is *clearly and distinctly thought, must be true.* Amongst these clear and distinct thoughts, he soon recognized the idea of God as the absolutely perfect being This idea, he reasoned, could not be formed in our minds by ourselves, for the imperfect can never originate the perfect; it must be *connate*, i.e., part of the original structure of our understanding, and implanted there by the perfect being himself. Hence, from the existence of the idea of perfection, D. inferred the existence of God as the originator of it; he inferred it also from the mere *nature of the idea*, because the idea of perfection involves existence. But if God exist, then we have a guarantee of the previously determined ground of certitude, for God the perfect being cannot deceive, and therefore whatever our consciousness clearly testifies, may be implicitly believed.

The most general fundamental principle of the philosophical system of D., is the essential difference of spirit and matter—the thinking and the extended substances—a difference so great, according to D., that they can exert no influence upon each other. Hence, in order to account for the correspondence betwixt the material and spiritual phenomena, he was obliged to have recourse to a constant co-operation (*concursus*) on the part of God; a doctrine which gave rise subsequently to the system called Occasianalism (q.v.), the principle of which was, that body and mind do not really affect each other, God being always the true cause of the apparent or occasional influence of one on the other. This doctrine received its complete development in the pre-established harmony of Leibnitz. See Leibnitz.

D. did not confine his attention to mental philosophy, but devoted himself systematically to the explanation of the properties of the bodies composing the material universe. In this department, his reforms amounted to a revolution, though many of his explanations of physical phenomena are purely *a priori*, and certainly sufficiently absurd. His corpuscular philosophy—in which he endeavored to explain all the appearances of the material world simply by the motion of the ultimate particles of bodies—was a great advance on the system held up to that time, according to which, special qualities and powers were assumed to account for every phenomenon. It was in mathematics, however, that D. achieved the greatest and most lasting results; and, indeed, his mathematical discoveries procured among his contemporaries, for his, in many cases, wild philosophical views, a greater importance than they in themselves are entitled to. It was D. who first recognized the true meaning of the negative roots of equations; and we owe to him the theorem, which is called by his name, that an equation may have as many positive roots as there are changes of sign in passing from term to term, and as many negative roots as there are continuations of sign, and not more of either kind. He gave a new and ingenious solution of equations of the fourth degree; and first introduced *exponents*, and thereby laid the foundation for calculating with *powers*. He showed, moreover, how to draw *tangents* and *normals* at every point of a geometrical curve, with the exception of mechanical or transcendental curves; and, what perhaps was his highest merit, he showed how to express the nature and the properties of every curve, by an equation between two variable co-ordinates: thus, in fact, originating *analytical geometry*, which has led to the brightest discoveries. D. was less happy in his cosmological exercitations, in which he attempted to explain the movements of the heavenly bodies by *vortices* (*tourbillons*), consisting in the currents of the ether which he supposed to fill the universe; a theory which not only then, but even after the discoveries of Newton, made a great noise, and found many adherents, but which has long ago been consigned to oblivion. The philosophical and mathematical works of D., which are composed in Latin, were published at Amsterdam (9 vols. 4to, 1692–1701, also in 1713), and at Paris (1724–1726, in 13 vols. 12mo). More recently, an edition of his whole works has been published by M. Cousin. See also the works of Martineau (1885).

DESCEN'DANTS. See Heir, Consanguinity, etc.; Succession.

DESCENT, Line of Swiftest, is that by which a body falling under the action of gravity, passes most quickly from one point to another. It is proved that, when the one point is not directly over the other, the line of swiftest descent is an arc of a cycloid (q.v.).

DESCHAMPS, Eustache (Morel), a poet of France of the 14th century. His life was a long series of tournaments, feasts, and battles, and he was one of the most popular men of his time. He saw the English invasion of 1358; was at the siege of Rheims, and witnessed the march on Chartres. In 1360, he became the vassal of the young princess Isabella, to whom he paid all possible poetic homage. He was a great traveler, but in France he lived the true life of a trouvere, wandering from castle to castle with his poems. He was master of arms to Charles V., who appointed him governor of Fismis. One of his ballads is addressed to Chaucer, the English poet. None of his works were published until 1832.

DESERET. See Utah.

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DESERT (*desertus*, solitary), a term used to denote any portion of the earth's surface which, from its barrenness, as in the case of the arid places of northern Africa and Arabia, or from its rank exuberance, as in the case of the *silvas* of South America, is unfitted to be the site of great commercial and industrial communities. Many names, each differing in meaning to some extent, are employed to designate the desert-plains of different countries. The *desert* proper may be said to signify the vast sandy plains of Africa and Arabia; while the flats extending from the Black sea on the n., and from Persia on the s., onward across Thibet and Tartary to the north-eastern coasts of Asia, are called *steppes;* those in the northern division of South America, *silvas* or desert-forests; those in the other portions of South America, *llanos* and *pampas;* and those in North America, *prairies* or *savannahs*. All these, though widely differing in individual characteristics, have in common the important physical features of wide extent and uniform general level. The *oases*, which are occasional spots in the desert where springs arise, and where the waste is enlivened by the presence of vegetation, are usually lower than the general level of the surrounding plain. The great and famous desert-ground, however, is to be found in the old world. A huge tract of comparatively rainless country stretches almost continuously from the north Atlantic to the shores of the north Pacific, thus forming a great belt of sand from e. to w., along the whole extent of the eastern hemisphere. Beginning from cape Nun on the n.w. coast of Africa, the *Great Sahara*, the grand type of all desert-grounds, stretches away eastward from the shores of the Atlantic to the banks of the Nile, its eastern division being frequently called the desert of *Libya*. Crossing the Nile, by the irrigation and inundations of which alone Egypt is preserved from subsiding into the waste condition of the surrounding country, the desert is again found, interposing a strip of hot sand between the right bank of the Nile and the western border of the Red sea, upon whose shores no rain ever falls. On the right shore of the Red sea, desert-grounds unvisited by any rains prevail over the greater portion of Arabia, and stretch onward, with occasional interruption, over Persia, Thibet, and the Tartaries. The most extensive desert in the eastern portion of these arid districts is called the desert of Gobi, which extends from the western extremity of Thibet n.e. to the shores of lake Baikal. See RAIN.

DESERTION (ARMY). When a soldier deserts, a board of survey is called to ascertain whether he has lost or abstracted any articles of government property, and if so, to determine the money value of the same, which is to be charged against the deserter's account on the next muster rolls of his company. The board also investigates the circumstances attending the desertion, especially the causes which induced it. Deserters absconding from, or received at a post, other than that to which they belong, are reported to the commanding officers of their companies or detachments. An enlisted man apprehended or surrendering as a deserter is critically examined by a medical officer at the post where he is received. If on account of disease, age, or other permanent disability, the man be found unfit for service, the report, with recommendations, is forwarded to headquarters; but, if the man is fit for service he is brought to trial by court-martial, or restored to duty without trial as the best interests of the service dictate. A reward of sixty dollars is paid to any civil officer having authority under the laws of the United States or of any State, Territory, or district for the arrest and delivery to the proper military authority of any soldier who deserts, and who is liable, under existing law, to trial and punishment for desertion. This reward is paid in full satisfaction of all expenses for arresting, keeping, and delivering, and its payment is reported to the commander of the company or detachment to which the deserter belongs. When enlisted men are sent in pursuit of a deserter, the expenses necessarily incurred are paid, whether he be apprehended or not, and are reported as in payments of rewards. Deserters are obliged to make good the time lost by desertion, unless discharged by competent authority. They are always considered as being again in service upon their return to military control. Restoration does not remove the charge of desertion from his record, nor does it relieve him from any of the forfeitures attached to that offense. Deserters are brought to trial with the least practical delay, and while awaiting trial they are allowed no pay, and only receive such clothing as is absolutely necessary. When a deserter from a former enlistment again enlists, his service during the unlawful enlistment is not considered in computing the time lost by desertion. Soldiers discovered to be deserters from the navy or the Marine Corps are dropped from the rolls of the army, and the offenders are held in confinement without pay until their cases are decided. No man is reported as a deserter until he has absented himself ten days from his post or company without authority, unless there shall be conclusive evidence of the man's intention not to return. Should he not return, or be apprehended, within the time named, his desertion is dated from the beginning of the unauthorized absence.

DESERTION (NAVY). Absence without leave, with a manifest intention not to return, is always regarded as desertion. Absence without leave, with the probability that the person does not intend to desert, is at first regarded as straggling, and at the expiration of ten days, if still absent, as desertion. In either case the commanding officer decides the point of intention and causes the person's name to be entered in the ship's log-book and marked on the paymaster's books as a deserter. Commanding

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officers are authorized to offer a reward not exceeding $20 for the recovery of a deserter, and one not exceeding $10 for the recovery of a straggler. In addition to the reward there are paid such expenses attending their lodgment, subsistence, and traveling as have been fairly incurred. Any reward paid for the apprehension and necessary expenses of a straggler is charged to his account. The wages due a deserter are forfeited to the United States; if in debt to the government at the time of desertion, his effects are sold and the proceeds are applied to liquidate it. The letter "R" marked against a person's name on the ship's books signifies desertion, and no application for its removal is entertained unless the Department is furnished with sufficient evidence that there was no intention to desert. Commanding officers of vessels at any United States naval station are not allowed to receive on board stragglers or deserters from other vessels, unless ordered so to do by the Bureau of Navigation, which has charge of the recruiting of the navy. Stragglers, enlisted for special service for the cruise of the vessel from which they are absent, are not received on board receiving ships. In case of shipwreck or any other circumstance, except capture by an enemy, whereby any person belonging to a vessel in the Navy becomes unavoidably separated from his command, it is his duty to proceed at once to the nearest ship, squadron, or station, and report himself to the officer in command. Should he not do so he is regarded as a deserter, and no claim for wages is allowed, unless he can prove that he was prevented by circumstances beyond his control. The punishment of death, or such other punishment as a court-martial may adjudge, can be inflicted on any person in the naval service who in time of war deserts or entices others to desert.

DESERTION, as applied to marital relations, has been defined as the willful withdrawal of one of the married parties from the other, or the voluntary refusal of one to renew a suspended cohabitation without justification existing either in the consent of the other party or the wrongful conduct of that party. In most of the States in this country desertion, when willful and accompanied by lack of support on the part of the husband, is made by law a cause of divorce. The statutes of the several States define what may be considered desertion in each, and usually declare the length of time after which desertion will be deemed a good cause for divorce. This time varies from one year to five; the greater number of the States adopt three years as the period, though nine or ten make it two years, seven or eight one year, and three or four five years. This longest period, for instance, is recognized by the Massachusetts divorce law, and under that law it has been ruled that the intentional abandoning for five consecutive years by a husband of the matrimonial companionship and intercourse and the denial to the wife of the protection of the husband's home would suffice to base a petition for divorce upon, even though during that time he had regularly contributed towards the support of the wife. A distinction must be made between desertion and mere absence; the former word always implies the non-assent of the person left and the violation by the deserter of some legal or moral duty. In cases of simple absence from the State the common law presumes the death of the person after the lapse of seven years, and in some States a shorter period than this is fixed by statute. Such absence may, like desertion, usually be made a ground for suit for divorce, but if the full period of absence has elapsed a second marriage could not, under any circumstances, be made the cause of a prosecution for bigamy. In England under the present law the wife may demand a divorce on account of willful desertion by the husband for two years without cause. It is only within thirty years that any redress whatever existed under the English law for a wife willfully deserted by her husband. Under the present divorce acts a deserted wife may obtain an order from a justice of the peace protecting against her husband any property acquired by her since the desertion.

DESHA, a co. in s.e. Arkansas on the Mississippi, and intersected by White and Arkansas rivers; 783 sq.m.; pop. '90, 10,324, includes colored. It is low and subject to inundation; productions agricultural. Co. seat, Arkansas City.

DESIC'CANTS, in medicine, are substances with astringent properties, which are serviceable in checking secretion and exhalation.

DESICCA'TION is the process of drying by the employment of heat, dry air, or chemical agents which have an affinity for water. Examples of the class of *desiccants* or drying substances are fused chloride of calcium, quicklime, fused carbonate of potash, and oil of vitriol. The latter is employed by being placed in a separate vessel near the substance to be dried, and under a bell jar.

DESIGN, a preliminary work, either in outline or color, in which the conception of the artist is indicated, and more or less fully expressed. The design ought to exhibit the whole composition and drawing of the work, though the last only in a general way. The design ought thus to be a correct, though not a complete representation of the future work. When colors are employed in a design, it is rather tentatively, and for the purpose of ascertaining what their effect will be, than with a view to actually producing the effect required. A sketch differs from a design, inasmuch as the former is generally applied to a first drawing from an object placed before the artist; the latter, to a first drawing of an object which he has imagined, either wholly, or in the attitude and combinations in which he represents it. In architecture, the term is applied to a drawing mathematically correct, but in which the effects to the eye which will ultimately be produced by distance and by light and shade, are altogether ignored. An architectural design is consequently scarcely intelligible on first sight.

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DESIGN, ENGLISH GOVT. SCHOOLS OF, the original designation of what are now officially termed "schools of art." The establishment of schools of design had for its object the training of designers and artisans in the principles and practice of the fine arts, with a view to the improvement of the artistic quality of our manufactures, by imparting, where requisite, more symmetry of form, harmonious arrangement of coloring, and general appropriateness of decoration. To Scotland is due the credit of having taken the lead in this matter, schools having been established at Edinburgh in 1760, "for teaching and promoting the art of drawing for the use of manufacturers, especially the drawing of patterns for the linen and woolen manufactures.' In 1837, a central school of design was established at Somerset house in London, followed shortly afterwards by about twenty branch schools in important seats of manufacturing industry. These schools were at first placed under the control of the board of trade, and the education in art afforded by them was in a great measure restricted to students of the artisan class. This attempt, however, to circumscribe the action of the schools, gradually gave way to the admission of a more mixed element into their rôle of students; but no radical change took place in the management of these schools until 1852. The great exhibition of 1851, which brought to light the marked deficiency in the artistic element of British as compared with foreign manufactures, was no doubt the main cause of the subject of national art education being taken up with renewed vigor. About this time Mr. Henry Cole was made general superintendent, and to him may in great measure be ascribed the complete reorganization of the government scheme for national art education that soon followed. It was grounded on the conviction that in order to improve the artistic taste of our manufactures, the first step was to elevate the art education of the people at large. For this end it was to be brought into closer alliance with the system of general education. A national art training-school for educating art-teachers was instituted at Marlborough house. The nucleus of an industrial museum was also formed there, the government granting a fund of £5,000 for the purchase of specimens of industrial art from the great exhibition collection. Such was the comparatively humble origin of its wealthy and magnificent successor, now established at South Kensington. From this date a rapid increase took place in the establishment of schools of art, which now number more than 120, situated all over the country; besides this, a comprehensive system of art-teaching is carried on in other educational institutions. The following is a summary of the official arrangements for promoting this work, abridged from the *Science and Art Directory*, 1875, of the committee of council on education, South Kensington:

"*Establishment of a National Art Training-school.*—A central school, for the benefit of the United Kingdom, is established at South Kensington for the training of art masters and mistresses, and for the training of students in drawing, designing, and modeling, to be applied to the requirements of trade and manufactures. A limited number of students are received into training as art-teachers, receiving a maintenance allowance, which is proportionate to their attainments and the certificates of qualifications obtained by them; in return for which they may be required to perform certain duties as teachers, and must engage to accept the situations to which they are recommended.

"*National Art Scholarships.*—A limited number of duly qualified students from the local schools of art, who may have given evidence of special aptitude for design, are eligible for appointments to national scholarships in the national art training-school, with weekly allowance for maintenance: these appointments are for one year only, but in cases of marked proficiency they may be renewed for a second year.

"*Aid to Schools of Art, etc.*—The department will aid the instruction given in schools of art, when under the direction of a local committee of not less than five well-known responsible persons, and instructed by teachers holding one or more art certificates of the third grade, provided that day classes be held, and that artisan night classes are taught at least three times in each week for two hours. A system of payment on results of teaching is made, on account of persons of the industrial classes, teachers, or their children above twelve years of age, who pay fees for their instruction In a similar way the department gives aid to the teaching of drawing in art night classes to artisans, in elementary day schools, and training colleges for teachers.

"*Annual Examinations.*—At the close of April or beginning of May in each year, a competitive local examination in drawing is held in all the schools of art on two consecutive evenings, conducted by means of examination papers supplied by the department, the subjects given being free-hand and model drawing, practical geometry and linear perspective, certificates and prizes being awarded to the successful competitors. The works of the students from all the schools of art are annually transmitted to the department in April for inspection, prizes being awarded to the most meritorious.

"*National Competition.*—The best of the more advanced of the above works are selected to compete with each other in this competition, which is annually held at Kensington in the month of May. The prize list for awards in this competition includes 10 gold, 30 silver, and 60 bronze medals. Additional prizes of works of art, books, etc., are also awarded.

"*Prizes to Art Masters.*—Monetary prizes are awarded annually, to the head-masters of schools of art, for the most satisfactory results in teaching.

"*Circulation of Books and Examples.*—The art library and collections of decorative

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art, etc., at S. Kensington are as far as possible made available for the purposes of instruction of schools of art.

"*Grants for New Buildings, and Purchase of Examples.*—In aid of new buildings to be adapted for schools of art, a grant not exceeding 2*s.* 6*d.* per superficial foot of internal area is made, up to a maximum of 4,000 feet. Grants of 75 per cent are made towards the cost of art examples selected from lists approved by the department, on behalf of art schools, mechanics' and other educational institutions."

DESIGN, SCHOOLS OF, institutions where the arts of ornamental and mechanical drawing are taught. They are numerous in the United States, and those of Philadelphia, Chicago, and Cincinnati are prominent. One of the oldest is the "National Academy of Design," founded 1828, in New York. Another, entirely free to all students, is in the Cooper institute in the same city. In the public school system of Massachusetts free instruction in drawing is provided.

DE'SIO, a t. of n. Italy, province of Milan. It is a well-built town, surrounded with gardens and vineyards, and has a fine hospital. Pop. 6000.

DESIRA'DE, or DESIDERA'DE, or DESËA'DA, the first of Columbus's discoveries during his second voyage, lies about 4 m. to the e. of Guadeloupe, of which, under France, it is a political dependency. It measures 6 m. by 2, and contains about 1637 inhabitants, chiefly emancipated slaves. The surface is elevated in proportion to the area, and the soil, though not generally fertile, is yet said to yield excellent cotton.

DESMAN. See MUSK RAT.

DESMIDIEÆ, according to the prevalent opinion of naturalists, a tribe or group of *algæ,* and as such ranked by some botanists among *diatomaceæ* (q.v.); whilst other naturalists regard them as belonging to the animal rather than to the vegetable kingdom, some also esteeming them to be vegetable who maintain the animal character of the true *diatomaceæ.* They are amongst those lowest organisms which seem to connect the animal and vegetable kingdoms at their common starting-point. The D. are readily distinguished from the true *diatomaceæ* by their rounded, not angular form, and by their want of silicious covering; also by their color, which is a herbaceous green, whilst the *diatomaceæ* are generally brownish. Unlike the *diatomaceæ,* they shrivel up, and lose their form in drying. They are, like them, microscopic, but are usually found in stagnant or very slowly running water, sometimes in brackish, but never in salt water. They may often be procured in great numbers, by pouring the water in which they exist upon a cloth; and if the cloth is kept moist, they will live for a long time, and their progress may be observed. They all exhibit a transverse constriction, sometimes not very distinct, but often almost dividing the single cell which forms the organism into two parts. It is at this constriction that new cells are formed; but this process ceases after a while, and a true reproduction takes place by spores, either through conjugation (q.v.) or swarming (q.v.). It is very much on account of these modes of reproduction, and of the presence of starch in the D., that they are confidently referred by naturalists to the vegetable kingdom. Our knowledge of the D. has been much extended by the work of Mr. Ralfs on the *British Desmidieæ.*

DES MOINES, a co. in s.e. Iowa, on the Mississippi, drained by Flint river, and intersected by several railroads; 400 sq. m.; pop. '90, 35,324. It has a prairie and forest surface, with fertile and well cultivated soil. Agriculture is the chief occupation. Co. seat, Burlington.

DES MOINES, a city, capital of Iowa, and co. seat of Polk co.; situated upon the Des Moines river, at its confluence with the Raccoon; 174 m. w. of Davenport and 138 m. e. of Omaha. It was settled in 1846, and in 1857 was chartered and became the capital of the state. The city is regularly laid out on a plateau 15 or 20 ft. above the water. In the rear is much higher ground, on which are many fine residences. The public buildings include the new state-house (cost, $3,000,000), situated on the east side of the Des Moines in a park of ten acres. There are a state arsenal, handsome city-hall, a Grand Opera house, U. S. government building accommodating the U. S. courts and other Federal offices, a city library, a state library and a public library, gas and electric lights, electric street railroads, and 8 bridges across the rivers. Besides many public and private schools, the educational institutions include the University of Des Moines (Bap.), Drake University (Disciples), Callanan College for young ladies, and two medical colleges; more than forty newspapers and magazines are published; there are national, state, and savings banks and several insurance companies. Two public parks of forty acres each, and large fair grounds, with a race-course, add to the attractions of the city. The city has exceptional railroad facilities, including the Chicago, Burlington and Quincy, Des Moines and Kansas City, Chicago, Rock Island and Pacific and Wabash. The industries include pork-packing, the manufacture of starch, glass, and liquors, etc., valued in 1890, $7,931,272; and the mining of coal, which abounds in the vicinity. Water is supplied from the Raccoon river by the Holly system. Pop. '50, 502; '80, 22,408; '90, 50,093.

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DES MOINES RIVER, the most important stream in Iowa, rising from a chain of lakes in Minnesota. It runs through about the center of the state and joins the Mississippi a little below the city of Keokuk. In its course of 300 m. it drains more than 10,000 sq.m. of fertile territory.

DESMON'CUS, a genus of palms, with slender stems, climbing over shrubs and trees, like the rattans (*calamus*) of the East Indies. They are the only American palms of this character. They have alternate pinnate leaves, with long hooked spines, instead of several of the uppermost leaflets, which make them very formidable to those who attempt to penetrate the forests where they grow. The species are pretty numerous, and all American.

DESMOULINS, CAMILLE, one of the prominent personages of the French revolution, was b. in 1762 at Guise, in Picardy; studied law at the Collége Louis-le-Grand, Paris; but on account of a stutter in his speech, did not prosecute the profession. His mind was filled with lofty but confused notions of classical republicanism, which found vent on the eve of the revolution in his *La Philosophie au Peuple Français* (Par. 1788), and *La France Libre* (Par. 1789). To his exaggerated denunciation was owing that outburst of popular fury which resulted in the destruction of the Bastile on the night of the 14th July, 1789. In the events of the Champ de Mars, Aug. 10, 1792, D., like his friend Danton, took a leading part, but was less implicated in the Sept. massacres. Elected to the national convention by the people of Paris, he voted for the death of Louis XVI. His relation to Danton, which had always in it something of dependence, induced him to take up the pen against the Girondists, and in his *Histoire des Brissotins*, he covered these moderate republicans with ridicule. In this, however, D. was not quite sincere, for many of the Girondists he highly esteemed, and he was himself by nature much more like Vergniaud and Brissot than like Robespierre and St. Just. When the guillotine was erected, D. saw his error, and bitterly repented his facile folly. Towards the end of 1793, he began to publish *Le Vieux Cordelier*, a journal which recommended, among other things, that the forms of justice should be restored, and attacked the members of the *Comité de Salut Public*. Twice accused before the Jacobin club, he was at length, on the night of the 30th Mar., 1794, along with Danton, arrested, and brought before the revolutionary tribunal. When asked his age, D. replied: "J'ai l'âge du sans-culotte, Jésus, c'est-à-dire trente-trois ans, âge fatal aux révolutionnaires." He was condemned without a hearing, and mounted the scaffold along with Danton, April 5, 1794. His wife, the beautiful Lucile Duplessis, vainly endeavored to excite an insurrection in his favor, and a fortnight after, she also was executed.—D. was essentially an enthusiast and hero-worshiper, always leaning for support on some stronger spirit than his own. His first idol was Mirabeau, after whose death he devoted himself to Danton. His aspirations were noble, his sympathies magnanimous, but he had neither sufficient moral resolution to oppose the political excesses of the popular party, nor even, until the close of his career, sufficient insight to assure him of their injustice and folly.

DESNA, a river of Russia, rises in the government of Smolensk, 50 m. s.e. of the t. of that name. It flows s.e. through the governments of Smolensk and Orel, until it reaches Briansk, where it enters the government of Tchernigov, through which it flows s., then s.w. to the town of Tchernigov, and finally joins the Dnieper nearly opposite Kiew. The D. is 550 m. in length, and is navigable throughout almost the whole of its course. Its chief affluents are the Seim, from the left, and from the right, the Snov.

DE SOTO, a co. in southwest Fla., organized 1887, between Kissimmee river and the gulf of Mexico, and crossed by the Plant system of railroads; 3272 square miles; pop. '90, 4944. The surface is rolling; the chief products are fruits and vegetables. Co. seat, Arcadia.

DE SOTO, a parish in n.w. Louisiana, on the Texas border, drained by Red and Sabine rivers; 865 sq. m.: pop. '90, 19,860, includes colored. Corn and cotton are the chief productions. Co. seat, Mansfield.

DE SOTO, a co. in n.w. Mississippi on the Tennessee border and the Mississippi, and crossed by the Illinois Central railroads; 480 sq. m.; pop. '90, 24,183, includes colored. The surface is level and much of it swampy. Productions, wheat, corn, cotton, and butter. Co. seat, Hernando.

DE SOTO, HERNANDO or FERNANDO, b. about 1500; one of the early Spanish explorers of North America. He distinguished himself when young in literary studies. In 1519 he accompanied Pedrasias Davila, his patron, to the isthmus of Darien, and was a most daring and independent opponent of the tyrannical rule of that officer, who was afterwards governor of Darien. Leaving Davila's service, in 1528, he explored the coast of Guatemala and Yucatan, seeking for a supposed water communication between the Atlantic and the Pacific. In 1532 he was in Pizarro's expedition for the conquest of Peru, and used all his influence with the Spanish butcher to prevent the murder of the Peruvian king. Having amassed a fortune, De Soto returned to Spain and married Davila's daughter. In 1536, moved by the reports of the mythical El Dorado, he undertook the conquest of Florida, and sailed in April, 1538, with 20 officers, 24 priests, and 600 men.

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May 25, 1539, he landed at Tampa bay, and followed the track of Narvaez, a former Spanish invader. In July, 1539 his ships were sent back to Havana. In 1540, he slowly worked westward, having many conflicts with the Indians. His second winter was spent in the Chickasaw country. These Indians, in the spring, burnt his camp and their own villages, because he attempted to force them to carry his baggage, and 40 of his men were burnt to death. After several days of marching mainly through swamps he reached the Mississippi, June, 1541, being the first European to look upon that mighty river. He constructed rude barges and crossed over, marching towards the highlands of White river, the w. limit of his exploration. Turning s. and passing the hot springs of Arkansas, he passed his third winter on the Washita river. In the spring he moved down the Washita to the Mississippi; and was marching along the latter river when he was taken with fever and died either in May or June, 1542. To keep the knowledge of his death from the natives, his body was sunk at night in the middle of the river. His wife died at Havana on the third day after hearing of his fate.

DESPOT AND DESPOTISM. A despotism is a form of government which has for its object the interests either of an individual or of a class, to the exclusion of those of the whole community. In the former case, it is usually called a tyranny, which is the degenerate form of monarchy; in the latter, it may be either an oligarchy, which is the degenerate form of aristocracy, or an ochlocracy, which is the degenerate form of democracy. A despot is the individual or class in whose favor and for whose benefit such a government is carried on. A despot may thus include any number of persons, from unity upwards—from a monarch to a mob. Much of the confusion which attends political speculation, and many of the disasters which befall political life in modern times, would be obviated, if these terms were used in the strictly scientific sense which was assigned to them by the Greek politicians more than 2000 years ago. See DICTATOR; MONARCHY; TYRANT.

DESSAIX, JOSEPH MARIE, Count, 1764–1834; a gen. in the French service, who studied and began to practice medicine in Paris, but went to Savoy in 1791, where he formed a democratic association, and became a capt. of volunteers. He was actively engaged at the siege of Toulon, and served under Napoleon in Italy. He was one of the council of 500 of 1798, and opposed the *coup d'état* of the 18th Brumaire. He was made a brig.gen.; and, in the campaign against Austria, gen. of division. Napoleon gave him the title of "the intrepid," and the dignity of a count of the empire. He was appointed commander of the national guards at Lyons, after the revolution of 1830.

DESSALINES, JACQUES, some time emperor of the island of Hayti (St. Domingo), was imported into that island from the gold coast of Africa as a slave. On the liberation of the slaves, 4th Feb., 1794, he became one of the most prominent among the negroes who rose in insurrection against the white colonists. After the organization of the insurrection, D. occupied the position of 1st lieut. to the leader Toussaint l'Ouverture; and in the wars against the French troops, was always distinguished by his agility and swiftness of movement, as well as by his fearlessness and ferocity. D. submitted, however, and took advantage of the amnesty granted on the capture of Toussaint in 1802; but shortly after, he headed another insurrection, attacked the French forces, defeated them in the battle of St. Mark, and compelled them to evacuate the island in Oct., 1803. He was created governor in Jan., 1804, when the people of the island declared themselves independent, and had himself crowned as emperor of Hayti, 8th Oct. of the same year, under the name of Jacques I.; but his despotism and cruelty soon alienated from him the sympathy and support even of those who were formerly his firmest adherents. On the 17th of Oct., 1806, D. was attacked and killed by Christophe, a negro chief, who succeeded him as Emperor Henri I. of Hayti.

DESSAU, a t. of northern Germany, and capital of the duchy of Anhalt, is situated on the left bank of the Mulde, not far from its junction with the Elbe, about 80 m. by railway s.w. of Berlin. The country round the town is pleasant and is very industriously cultivated. D. consists of three parts, the old and new town, and the Sand, and it has besides three suburbs. Among the principal buildings are the ducal palace, a noble structure, built in 1748, with a picture-gallery, and a library containing many MSS. of Luther; a town hall, an elegant theatre, and several churches and benevolent institutions. Its educational establishments are numerous and excellent. It has a fine cemetery, and the environs are surrounded by beautiful gardens. The manufactures are woolen cloth, hosiery, tobacco, and spirits. It is celebrated for the victory which Wallenstein won here over Count Mansfeld in 1626 during the Thirty Years' War. Pop. '95, 42,395.

DE STAËL. See STAËL-HOLSTEIN.

DESTERRO, NOSSA SENHORA DO DESTERRO, or SANTA CATHARINA, a port of Brazil, the most important town in the province of Santa Catharina, on the w. coast of the island bearing the same name; 27° 30′ s., and 48° 30′ w.; pop. about 6000. It is strongly fortified; its harbor is excellent, and it has some foreign commerce. It is well laid out, but poorly built.

DESTUTT DE TRACY, ANTOINE LOUIS CLAUDE, Count de Tracy, 1754–1836; a French statesman, member of the provincial assembly of the Bourbonnais, and appointed delegate of the nobility to the states-general in 1789. He was a leader of reform meas-

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ures. In 1792, he joined the army under Lafayette and followed him over the frontier. Returning secretly to France, he was arrested and imprisoned. After the revolution, he was made a senator. He voted for the overthrow of the empire in 1814, but opposed reactionary measures. He adopted the views of Condillac, and became an earnest materialist. He wrote, among other works, a *Commentary on the Spirit of the Laws*, which was translated by president Jackson for a text-book.

DETAILLE, Jean-Baptiste Édouard, b. Paris, 1848; pupil of Meissonier. He is especially celebrated as a war artist, and has been described as the "Desgoffe of military painting." Among his pictures are, "The Halt of Infantry," "Repose during Drill," "Engagement between Cossacks and Guards of Honor, 1814," "Souvenir of Camp St. Maur," "The Conquerors," "A Reconnoitre," and "Salute to the Wounded;" and the following in water-colors: "A Hussar," and "The French Cuirassiers Bringing in Bavarian Prisoners." The latter, and his "Passing Regiment," in oils, are at the Corcoran gallery in Washington. He was made a chevalier of the legion of honor for his "Retreat."

DETECTIVES, are a species of police officers, differing from the ordinary police in having no specific beat or round, and in being concerned in the detection rather than the prevention of crime. As a rule they wear plain clothes, and although they find it necessary to keep up a personal knowledge of the criminal population, especially of that portion of it whose members they may at one time or another be likely to be in search of, their efficiency is increased by preserving as far as possible their own incognito. Their work, long and laborious though it may be, must not see the light. Their duty is to pursue the criminal through all his shiftings and turnings until the case is clear against him, and then to draw him from his hiding place and hand him over to an ordinary constable to bring to judgment. Every large city both in the U. S. and in Great Britain employs D. as an integral part of its police force, and in addition is usually supplied with private D. agencies. The latter are thoroughly organized and some of them employ many "shadows," whose services are utilized in the mercantile world to watch the actions of suspected associates or employees, or to track absconding defaulters, and in social life to search for evidences of domestic laxness. The pioneer in the private D. system was Allen G. Pinkerton (q.v.). A brief experience on the city detective force in Chicago had convinced him of the evil effects of carrying on a detective system under the control of the semi-political body like the American police, and of the feasibility of establishing an independent detective bureau. He made the experiment with half a dozen subordinates in Chicago, 1852, and his success soon led to the establishment of branch offices in every large commercial city in the U. S., and subsequently in Paris and in London.

DETACHMENT, in military matters, is a small but indefinite number of troops, sent for some special duties away from the regiment, brigade, division, or army, as the case may be. In a fleet, also, a D. of one or more ships may be told off in a similar way.

DETERMINANTS, the name given to a new method of great use, *inter alia*, in the solution of equations embracing several unknown quantities, whereby the student can readily write down the values, in terms of the known quantities, of all the unknown.

DETERMINATE PROBLEM, in geometry, a problem of a limited number of solutions, as: "Given the base, perimetre, and area, to construct a triangle." For this there are four general solutions. But if either of the three propositions be omitted, it becomes indeterminate.

DETERMINISM: the name given to a system of philosophy which denies the freedom of the human will, and refers all seeming volition to a necessity which is none the less strong because concealed. It is opposed to Indifferentism (q. v.) in maintaining that we can conceive of the will only as a part of that vast concrete something which we call human nature; and that it is not an absolute Ego, separate, distinct, and capable of accepting or rejecting as it pleases. Character, as it appears to us, rules the determinations of the will; but it is also a *result* of these determinations. The philosophy of the theory, which, on very diverse lines, has been upheld by such thinkers as Julius Müller, Schopenhauer, Buckle, and J. S. Mill, seems to bind the nature of man into closer relationship with the entire universe; but, notwithstanding the attractiveness of the analogies which it suggests, it is felt to be unsatisfactory and incomplete. There are facts of consciousness which no doctrine of D. can explain,—*e. g.*, the sense of guilt, the feeling of obligation. It is, indeed, asserted by some that necessity is only one aspect of freedom, instead of the reverse. Materialistic D. is not upheld by so many philosophers as formerly; and the scheme is approached more from an idealistic standpoint. It has formed the groundwork of much theological discussion and exegesis. Augustine urged the doctrine of necessity against Pelagius and his followers, and found in its mazes a reason for the Divine acts of grace. The early Calvinists were equally zealous in its maintenance.

DETINUE, in English law, an action for the recovery of goods wrongfully detained, or their value, with damages and costs. The action is for the recovery of a specific article; the goods detained must, therefore, be of such a character that they can be distinguished from others, as a horse, money in a bag, etc. In this respect, the action of

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D. differs from an ordinary action at law, and judgment in D. is accompanied by its special remedy for enforcing execution—called writ of *distringas*.

DETMOLD, a t. of northwestern Germany, on the Werre, capital of the principality of Lippe-Detmold, 47 m. s.w. of Hanover, consists of an old and new town, the latter of which is well built, and adorned with public walks and gardens. The chief buildings are the palace, a fine old castellated edifice, the gymnasium, and the theater. D. has also a training-school, a public library, and a hospital. The manufactures are leather, woolens, and linens. There are also several breweries. On the Grotenburg, about 2 m. from D., is a colossal copper statue of Hermann (q.v.). Pop. '85, 8916; '95, 11,237.

DETONA'TION is the phenomenon of combustion with explosive rapidity, accompanied by sound and light. Thus the firing of gunpowder, gun-cotton, and fulminating powders, as in a percussion-cap, is detonation.

DETRI'TUS, applied in geology to accumulations formed by the disintegration of rocks, which consist of gravel, sand, or clay, or of an admixture of them.

DE TROBRIAND, PHILIP REGIS, b. France, 1816; a man of letters, long resident in the United States. In the war of the secession he was an officer on the union side, and became brevet brig.-gen. in the United States army. He was retired in 1879. Author of several works in French, including *Four Years in the Army of the Potomac*. From 1854 to 1861, he was editor of the *Courrier des Etats Unis*. He d. July 15th, 1897.

DETROIT (French, *Détroit*, the strait), chief city of Michigan, port of entry, and capital of Wayne county, is on the north bank of the Detroit River, in latitude 42° 19′ 53″ north, and longitude 82° 58′ west; about eighteen miles from Lake Erie; seven miles from Lake St. Clair; eighty miles east-southeast of Lansing; 250 miles east by north of Chicago, and 225 west by south of Buffalo.

This section was first visited by a party of Frenchmen, who laid claim to it, as early as 1610, and again in 1670–79 by La Salle, but no permanent settlement was made until 1701, when Fort Pontchartrain was built. Emigrants soon made their appearance, and Sieur de la Motte Cadillac was the first governor. In 1762 the English obtained possession of it, by the close of the French war; and in 1763, May 12th to October 12th, the Indian chieftain, Pontiac, laid siege to it in his efforts to expel the whites from his country. Its importance as a fur-trading station rapidly increased, but in 1778 it contained only 300 inhabitants, and these occupied log huts almost entirely. The British erected Fort Le Noult, which, after the Americans came into possession, in 1787, became Fort Shelby, with General Arthur St. Clair for the first governor. The place was destroyed by fire in 1805, and in 1807 a new town was laid out. In the war of 1812 it was surrendered to the British by General Hull, but was retaken by the Americans after the battle of Lake Erie in 1813. In 1815 it was incorporated as a village, and became a city in 1824. It was the capital of the territory of Michigan from 1805–37, and of the state 1837–47.

The river, which is the dividing line between the United States and Canada at this point, is half a mile wide, over thirty feet deep, and has a current of two and one-quarter miles per hour. It has truly been called "The Dardanelles of the New World," leading from one lake to another, and it furnishes a magnificent harbor, with no freshets, and a fine river front. Fort Wayne, a mile below the city, commands the channel, and its works cover 65 acres, which, although not yet completed, consist of a series of batteries, protected by earth-works and garrisoned by a force of infantry. The river contains many beautiful islands, the largest of which, Grosse Isle, is furnished with a lighthouse. Belle Isle was purchased in 1879, at a cost of $200,000, and nearly $1,000,000 has been spent since to transform it into a delightful park. It is connected with the city by a bridge that cost $300,000.

The city rises gradually from the edge of the river, which is here 597 feet above sea-level, at the rate of nearly sixty feet to the mile, giving a perfect drainage. Detroit has an average temperature in summer of 68.05°, in winter of 26.61°, and is abundantly supplied with pure water, many hundred feet of pipe extending throughout the city, the aggregate cost of construction being $6,121,240. Most of the streets, well shaded, cross each other at right angles, and these are intersected by several avenues, from 100–200 feet wide, radiating like the spokes of a wheel from the Grand Circus, a large park in the heart of the city, semi-circular in shape. This is crossed by Woodward Avenue, which divides the city into nearly equal portions. This intersection of the streets and avenues results in a number of small triangular parks, two of which contain handsome fountains. Woodward and Jefferson Avenues and West Fort Street are filled with expensive dwellings, surrounded by beautiful grounds. Michigan and Lafayette Avenues have many noticeable buildings, and the banking houses of Griswold St. equal those of Wall St. in New York. A boulevard, encircling the city for twelve miles, from Belle Isle bridge almost to the western boundary, is in progress. The Campus Martius is a plot of ground 600 feet long and 250 feet wide, an enlargement of Woodward Avenue, about half a mile from the river. Besides Belle Isle Park, there are Linden Park, fifty acres, and Clark Park, seventeen acres. The beautiful islands on Lake St. Clair and on the Detroit River, south of the city, are filled with the summer residences of the citizens, and Grosse Isle, the residence of the chief, Pontiac, is also a favorite resort.

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Conspicuous in architectural importance is the City Hall, facing the Campus Martius, 200 feet long by 90 wide, built of sandstone, at a cost of $600,000. In the Campus is a soldiers' monument, designed by Randolph Rogers, of bronze and granite, which cost $75,000. It is fifty-five feet high and is surmounted by an allegorical representation of Michigan. The United States custom house and post office, three opera houses, high school building, Michigan central depot, new post office (cost $2,000,000), Union depot, (opened in 1893, cost $1,000,000), chamber of commerce, the fine majestic building finished in 1896, and Young Men's Christian Association buildings are conspicuous. The House of Correction, which has a world-wide reputation as a reformatory institution, is valued at upward of $400,000, and can accommodate 6000 prisoners. The Roman Catholic Cathedral is the largest church edifice, and the Fort St. Presbyterian, Woodward Avenue Baptist, and St. Paul's (Prot. Epis.) churches are notably beautiful structures. The Convent of the Sacred Heart is a large and handsome edifice. There are more than 150 churches and chapels, many national, savings, and state banks, building and loan associations, etc.

The educational advantages of Detroit are superior, with more than sixty public school buildings, annual expenses of the schools over $1,000,000; Detroit College, Detroit normal training school, Detroit Seminary, Detroit school for boys, Detroit home and day school, Detroit college of medicine, Michigan college of medicine and surgery, Detroit college of law, Museum of Art with art school, several convents, many Roman Catholic and German Lutheran parochial schools, a large number of private institutions, and several commercial colleges. There are a scientific association with a valuable museum, and a public and several college and association libraries.

Detroit has many charities, among them four hospitals, including the Harper Hospital, founded by the joint gifts of Walter Harper and Nancy Martin, and valued at $200,000; four orphan and two foundling asylums; four women's hospitals; home for magdalens and aged poor; an old ladies' home; industrial school, and many other benevolent institutions of less importance. Of several cemeteries, Mt. Elliot, Woodmere, and Elmwood are the principal. More than three-score newspapers are published, daily, weekly, and monthly, several of them in German.

The city is divided into sixteen wards, each extending from Detroit River northward to the city limits, and numbered east and west from Woodward Avenue. The police force is strong, well-uniformed, and, besides a noticeable headquarters, has several sub-stations. The annual expense is over $475,000. The paid fire department has steam engines, chemical engines, hook and ladder apparatus, supply-wagons, telegraph lines, alarm boxes, etc., costing $1,000,000, run at an annual expense of over $500,000.

The judiciary consists of a police court, a recorder's court, a superior court of three judges, the United States circuit court, the Wayne county circuit court, and the probate court of Wayne county. The United States district court for eastern Michigan also sits at Detroit, and the United States internal revenue office and the department in charge of the Lake lighthouses are located here. It is also the headquarters of the military department of the Lakes. The city is lighted by a system of lofty steel towers, 150–170 feet high, supporting strong electric lights, which produce a striking effect from land or lake as the city is approached by night. The water-works are situated near Lake St. Clair, from which and Detroit river the water is pumped.

The manufacturing interests are very extensive—huge iron foundries, immense blast-furnaces, copper smelting works, locomotive and car-shops, ship-yards, dry-docks, iron bridge works, safe manufactories, furniture, bricks, tobacco and cigars, malt and distilled liquors, pork-packing, drugs and chemicals, paints and oils, etc. The whole number of establishments given by the census of 1890 was 1746; capital invested, $45,041,167; workmen, 38,178, amount paid in wages, $18,900,309; value of materials, $41,360,058; value of products, $77,351,546. A branch of the Pullman Car Works is established here, which adds much to the value of the car and steam railway manufacturing interests, valued in 1890 at $10,278,281; the foundry and machine-shop products were worth $7,631,103; tobacco and cigars, $6,635,891; slaughtering and meat-packing, $2,770,178; lumber and planing-mill interests, $3,179,086; chemicals and paints, $3,970,447; iron and steel, $2,432,493. In the yard of the great Michigan Stove Works is the stump of a tree surmounted by a figure of Pontiac, the Indian chief, which was erected to mark the spot where that warrior surprised and slew Captain Dalzell and his troops in 1763.

Some idea of the commanding position occupied by Detroit may be obtained by observing its location upon the narrow strait leading from Lake Erie into Lake St. Clair, and from thence to Lake Huron; thus all the vessels from the Great Lakes have to pass this port. The volume of traffic is immense during seven months of the year, while navigation is open. In the calendar year 1896 the imports of merchandise were valued at $3,153,609; and the exports of domestic productions at $11,325,807. Vessels of all kinds may be seen here—sailing vessels, steam vessels, barges, ferries plying to Belle Isle, and Windsor, and Walkerville; steamboats to Put-in-Bay Islands, St. Clair, Buffalo, Cleveland, Port Huron, Sault Ste. Marie, Mackinaw, and other points on the Great Lakes. Foreign commerce is almost exclusively with the British possessions, and the principal exports are corn, oats, wheat, lumber, cotton, hogs, lard, furs, hides, hops, beef, wool, etc.

The assessed value of real estate and personal property in 1895 was $209,586,330; the gross bonded debt, $4,915,000; resources in sinking fund, $1,376,517; net debt, $3,538,483. The city owned property valued at $18,756,319, all free from encumbrance.

Population, 1782, 219; 1810, 770; 1830, 2222; 1860, 45,019; 1880, 116,342—17,292 Germans, 10,754 Canadians; 1890, 205,876.

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DETROIT, river or strait, connects lakes St. Clair and Erie, and flowing s.w. and s., separates Michigan from Ontario, Canada It is about 22 m. long; from ½ to 3 m. wide; of great depth; swift in current; and admits the largest vessels. There are many islands, and the scenery is very beautiful. The chief tributaries are Rivière aux Canards, on the Canadian side, and Rouge river on the American.

DETTINGEN, a village of Bavaria (lower Franconia), on the right bank of the Main; noted as the scene of a battle during the Austrian wars of succession; June 27, 1743, George II. of England headed the armies of the allies, and this was the last occasion in which a king of England appeared in person on the field. The army of the allies, composed chiefly of English, Hanoverians, and Hessians, amounted in all to 37,000 men; while the French leader, Noailles, had an army of about 60,000. The former occupied a valley extending from Aschaffenburg to Dettingen. Before the fight, Noailles threw 12,000 men into Aschaffenburg, and so made it impossible for his opponents to retreat with safety. The defile of D. in front of the allies was also held by De Grammont with 25,000 men, while Noailles himself, shifting his position on the Main, so as to command with his batteries the flank and rear of the allies, rendered their position so critical that George resolved to force his way through the enemy. De Grammont having rashly attacked the British and Hanoverian infantry, the latter received them without breaking; then advanced, led by George on foot, driving the French before them into promiscuous retreat. The total loss of the French was about 6000; of the allies, 2000.

DEUCA'LION, according to the Greek myth, was a son of Prometheus, grandson of Iapetus, and husband of Pyrrha. When Zeus had resolved to destroy the race of men by a flood, D. built and provisioned, by the advice of his father, an ark or ship, which he entered along with his wife. The flood came, and all Hellas was submerged. D. floated about for nine days, and on the subsidence of the waters, the ark rested on Mt. Parnassus. Other versions of the myth, however, make it rest on Mt. Othrys in Thessaly, on Mt. Athos, or on Mt. Etna in Sicily. D. and Pyrrha, according to one account, now offered up sacrifice to Zeus *Phyxius*, i.e., Zeus, the protector of fugitives, and prayed that he would repeople the world, which he did; but the more common tradition was, that they went to the sanctuary of Themis for this purpose, and were told by the goddess that they must throw behind them the bones of their mother as they departed from the temple. Understanding by the "bones of their mother," the stones of the earth, they obeyed the injunction, and from those thrown by D. sprang up men, and from those by Pyrrha, women. D. built his first dwelling-place at Opus or Cynus. He is also said to have founded the sanctuary of Olympian Jove at Athens, and in later ages his tomb in the vicinity was long pointed out. D. had by Pyrrha several children, Hellen, Amphictyon, Protogeneia, and others. It was at one time extensively believed, even by intelligent scholars, that the myth of D. was a corrupted tradition of the Noachian deluge, but this untenable opinion is now all but universally abandoned. The myth is a comparatively late one, being mentioned neither by Homer nor Hesiod.

DEU'EL, a co. in w. Nebraska; 2130 sq. m.; pop. '90, 2893. Co. seat, Chappell.

DEU'EL, a co. in e. S. Dakota, on the Minnesota border, organized in 1878. It is watered by a number of lakes, and by affluents of the Big Sioux and Minnesota rivers; 630 sq. m. Pop. 1890, 4574. Co. seat, Clear Lake.

DEUS EX MA'CHINA, an expression borrowed from the classical theater. In conformity with the popular mythological beliefs of their age, the tragic poets of Greece, instead of bringing about the dénouement of their plots by natural means, had often recourse to a more expeditious mode—viz., the intervention of a god, who descended in a machine, and abruptly solved whatever difficulty barred the proper termination of the piece. As examples of the *Deus ex Machina*, take the appearance of Hercules in the *Philoctetes*, and of Diana in the *Iphigenia in Tauris*. In modern tragedy, when a person or incident is introduced arbitrarily, *forced*, as it were, into the conduct of a plot, merely to remedy some inartistic negligence in its construction, or to save the author the labor of further ingenuity, such a contrivance is metaphorically called a *Deus ex Machina*. In modern comedy, the rich old uncle who suddenly comes home from the West Indies, and rescues the young couple (hero and heroine) from their dreadful pecuniary embarrassment, serves exactly the same purpose. When a savant or philosopher cannot explain some fact of nature by any known law, and has recourse to the supposition of the direct and immediate action of God, his assumption is also termed by analogy a *Deus ex Machina*.

DEUTERONOMY is the English title given to the fifth book of Moses, derived from the Greek translation, and signifying "repetition of the law." It well expresses the general scope of the book, which is a review of the 40 years in the wilderness, including the laws which had been given, and the events which had occurred. Whatever may have been the time occupied in writing it, the uttering of it to the people began two months before the end of the 40th year. To the arguments advanced by some writers that it was not written by Moses, the following answers (among others) have been given: 1. These writers are not agreed among themselves. The older of them affirm that D. was written long after the other books of the Pentateuch; the newer school pronounce it the quarry from which the materials of the others were taken.

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This conflict of opinions at least precludes the assertion that its style betrays its late origin. 2. The alleged anachronisms, discrepancies, and difficulties admit, for the most part, of easy and complete explanation on the supposition that Moses was the author. 3. The unanimous and unwavering testimony of the ancient Jewish church and nation is that Moses was the author of the book. This is testimony against themselves, as it involves the admission that their sufferings as a nation were divine judgments on their sins. Consequently, their possession of the book and acknowledgment of it as a writing of Moses can be rationally accounted for only on the supposition that the generation in the wilderness received it from his hand. At no subsequent period could it have been imposed on them as a law which had been given them in the wilderness, under acknowledged obligation to which they had always lived, and for the transgression of which they had been punished in the past, and would be in the future. And as no generation, after the settlement in Canaan, could have been persuaded to receive it for the first time, so to every subsequent generation the temptation became stronger, if it were possible, to deny and reject its authority. 4. It had, in a remarkable manner, the attestation of the apostles and of Christ. Peter and Stephen quoted from it to large assemblies of Jews, as truly the words of Moses; Paul cites it in writing to Jews at Rome; and Christ drew from it, as the word of God, his answers to all the temptations of Satan.

It contains: I. A review of the history from Horeb to Kadesh; from Kadesh to the land of the Amorites; of Moses' own transgression, his exclusion from Canaan, and the appointment of Joshua in his stead; of the reception of the law at Horeb, spoken by the voice of God, and written by him on tablets of stone. The review of these events is made the ground of an earnest exhortation to reverence, obedience, and gratitude to God. II. A review of the laws: 1. Of the moral law, and of the effect produced on the people by the proclamation of it; of the first and second commandments especially, with exhortations to obedience, and warnings against transgression; and, again, of the whole law, with a renewed appeal for obedience in view of past experience; of future blessings promised, and wrath threatened. 2. Of laws for the regulation of religious ceremonial and of personal life; for the abolition of idolatry and the observance of divine worship; against false prophets, idolatrous cities, and personal disfiguration as a sign of mourning; concerning clean and unclean animals, the year of release, the annual feasts, judges and justice; and against groves and images. 3. Of the strictly judicial law in numerous details. III. Provision for the confirmation of the law by writing it on large stone tablets to be set up on Mt. Ebal, with the uttering of curses on transgressors, and of blessings on the faithful. This is followed by an earnest call for consecration of heart and life to God. Pardon is promised to the penitent, and the choice of life or death is set before all. IV. The close of the official and personal history of Moses. He appointed Joshua to succeed him, charging him to be faithful and courageous; delivered a copy of the law to the priests and Levites to be placed by the ark of the covenant, and read publicly to the congregation every seven years; and as he had commenced the journey through the wilderness with a triumphant song, so now he closed it with songs of review, warning, and prophetical blessing on the tribes. The account of his seeing the promised land, the record of his death and burial, and the testimony to his greatness as a prophet and servant of the Lord, were added, probably, by Joshua, as the appointed finisher of his work.

DEUTSCH, EMANUEL OSCAR, was b. of Jewish parents, at Neisse in Silesia, in 1829. His education was begun by an uncle, to whom he owed his mastery of the whole range of Hebrew and Chaldee literature, and was finished at the university of Berlin. In 1855, he came to England to fill an appointment in the national library; and from this time he was known for his labors in the British museum, and his efforts to promote the study of the Semitic languages. He is best known to the outside world by his brilliant article on the *Talmud* in the *Quarterly Review*, to which he also furnished an article on *Islam*. He wrote excellent articles on the *Targum* and the *Samaritan Pentateuch* for Dr. Smith's *Dictionary of the Bible*, and was a valued contributor to the present work, for which he wrote nearly 200 articles. The best monument of his official work in the national library is to be found in the *Phœnician Inscriptions*, edited by Mr. Vaux, to whom D. rendered most valuable assistance. D. died in 1873 at Alexandria, whither he had gone in the pursuit of health. His engrossing public duties and comparatively short life prevented D. from fulfilling the dream of his life, an elaborate work on the *Talmud*. A volume of his literary remains, with a sketch of his life, was published in 1874.

DEUTZ. See COLOGNE.

DEUTZIA, a genus of shrubs of the natural order *Philadelphaceæ*, natives of the n. of India, China, and Japan, some of which are now reckoned among the favorite greenhouse plants of Britain, in some situations even enduring the open air. They produce abundance of beautiful white flowers. The leaves of *D. scabra* are so rough with siliceous hairs, that they are used by joiners in Japan for polishing wood.

DEUX-PONTS (Ger. *Zweibrücken*), a t. of Rhenish Bavaria, picturesquely situated among wooded heights on the Erbach, near its junction with the Serre, 34 m. w.n.w. of Landau. Deux-Ponts, which owes its name to the two bridges which there cross the Erbach, is well built, and has among its principal buildings a Lutheran cathedral, also

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the remains of an ancient ducal palace, now used as a Catholic chapel. Its manufactures are cotton cloth, machinery, leather, silk plush, etc. Pop. '90, 11,000.

Deux-Ponts, or, in Latin, Bipontium (whence the name Bipontine given to the edition of Greek and Latin classics here printed by a society of scholars in 1779), is not mentioned in history till 1197, and was then in the possession of counts of Deux-Ponts.

DEV, or DEW (Persian), and DEVA (Sanscrit); kindred names; in Persian applied, according to Zoroaster, to a race of demons created by Ahriman, and subject to his commands. The Sanscrit word in Hindu mythology signifies "gods."

DEVANAGARI. From the Sanskrit, meaning the *nagari* of the Gods or the Brahmans; *nagari* (perhaps "of the city") being the comprehensive term, and *devanagari* the specific. A name applied to the Sanskrit alphabet as used in the printed sacred books of Sanskrit literature. The term is extensively employed in treatises on paleography, but as the natives do not use it, it was probably coined by some English colonist at the close of the last century. Devanagari has been the principal written medium of the learned men and priests of India for over two thousand years, and is now employed in European editions of Sanskrit literature, but the natives, except in the heart of India, or Hindostan proper, unite the characters of their own varied vernaculars. Its origin is doubtful, as is that of all the Indian alphabets, but its striking similarity to the old Phœnician makes it highly probable that its germ was a Semitic alphabet, the differentiation and development of which must have taken place very early though gradually. As to how or why the Semitic alphabet was introduced nothing is yet known, in spite of the many ingenious theories that have been advanced. The Devanagari letters—fourteen vowels and thirty-three simple consonants—can express almost every conceivable gradation of sound, and the pronunciation of each one is fixed and invariable. They have a number of minor variations in form, according to their locality and period and the individual who wrote them, and these have been perpetuated in typè. See SANSKRIT.

DE'VAPRAYA'GA, a t. in India, remarkable chiefly for its situation, stands in the fork of the Aluknunda and the Bhageerettee, whose united waters immediately assume the name of Ganges. It is in lat. 30° 8′ n., and long. 78° 39′ e., belonging to the protected state of Gurwhal; and its elevation above the point of confluence is 313, and above the sea, 2,266 feet. Marking, as it were, the source of the sacred river, D. is a favorite place of pilgrimage for the Hindus; and, in fact, its only permanent pop. consists of about 1000 Brahmans from the Deccan. In connection with the holy character of the locality, are two ancient temples, a flight of steps in the rock down to the very brink of the mingled streams, and three basins excavated in the solid stone a little below the level of the surface of the current. The town was much shattered by an earthquake in 1803, but was subsequently repaired at the expense of Scindia, the Mahratta chief of Gwalior.

DEVELOP, in algebra, to write out in full the operations set down in symbols. In geometry, to develop a curved surface is to produce on a plane an equivalent surface, as by rolling the curved surface so that all parts shall successively touch the plane.

DEVELOPMENT OF DOCTRINE signifies the modifying process through which Christian or philosophical opinion passes in its transmission from age to age. At first comparatively simple in its expression, doctrine has a tendency to become more complicated and technical in structure as argument is exercised upon it, and the spirit of controversy excited. The difference between the doctrinal statements in the Pauline epistles and the earlier creeds, such as that of Nicæa, the elaborate expositions of the mediæval theologians, and again of the Protestant theologians of the 16th and 17th centuries, is a difference at once appreciable by the theologian, as it is full of interest to him. There is, beyond doubt, at these several points in the history of the church, a certain growth or extension of Christian opinion called forth by, and corresponding to, the exigencies of the times. This is what is meant by the development of Christian doctrine, and the name denotes with sufficient propriety an unquestioned series of phenomena.

It is true that the idea of development in doctrine is one of modern origin, unknown to the earlier dogmatic ages of the church. But this merely proves that it is only in recent times that the history of the church has been reviewed in a critical and philosophical spirit. The idea of development is modern in its application to science altogether, and especially to the science of history. The ground upon which it is vindicated, in its application to Christian doctrine, is, that this doctrine is not a mere repetition of Christian truth in the language of inspiration, but really the rational or argumentative exposition of this truth. It represents this truth as it appears to the Christian reason in different ages. It is the expression of what has been called the *Christian consciousness* working in contact with the text of Scripture. The Nicene doctrine of the Trinity, for example, is the definite explanation which the Christian reason of the 4th c. gave to the undefined and general expressions of the gospels and epistles as to the relation of the Father and the Son. The doctrine of the atonement, as a *satisfaction* to God for the sins of the world, is first clearly and explicitly unfolded by St. Anselm in the 11th century. It is not meant that the elements of either of these doctrines are not to be found in Scripture, or that they are the product of human ingenuity; it is only affirmed that the scriptural elements in the one case and the other, were first clearly and argumentatively unfolded by the ingenuity of the Christian reason at these different times. The very idea of *doctrine* implies the employment of reason, and the exercise of inquiry and

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argument upon the divine truth of Scripture. It is this truth analyzed and reflectively given forth—not the mere equivalent of Scripture, but something derived from it by Christian investigation and culture. Such a process of investigation and culture is necessarily variable and progressive. The divine fact remaining the same, the human explanation or doctrine of it may and does greatly vary. The course of this variation—the rising and falling of the human apprehension of the meaning of Scripture—is the development of doctrine.

This view is to be distinguished from that which characterizes the extreme subjective school of German theology. According to this school, Christian doctrine is nothing else than the expression of the Christian consciousness at any time. Scripture maintains no permanent or authoritative relation to it. It is all progress—a continued flux, without any normal standard or expression. Scripture may be its primary expression, but it may leave its fountain-head, and in the course of time issue in developments not necessarily bound to Scripture. But according to the view above set forth, Scripture remains the absolute and complete revelation of Christian doctrine, which is continually unfolded, but never exhausted by inquiry—beyond which right reason and truth never travel. The Christian revelation not only admits of, but demands constant criticism, as the means of unfolding more comprehensively and perfectly its contents, but it remains in itself the consummate expression of all spiritual truth; and it is this very peculiarity of the Christian revelation that makes its contents capable of continual and ever fresh development. It is just because its substance is divine, that its doctrinal expressions never cease to interest and to answer to the necessities of successive times. Other religions, while capable of development, reach a point where they cease to have any further living meaning, and pass on the one hand into mere popular mythology, or into an esoteric priestly tradition. They become transmuted into poetry or some ordinary product of philosophical speculation. Civilization overtakes and supplants them. But it is of the distinguishing divine character of Christianity that its doctrines possess a vital ever-renewing power, capable of adaptation to the highest forms of human civilization, and full of enlightenment and guidance to the most advanced intelligence. The development of Christian doctrine, therefore, is not merely a subject of curious and important study in the past, but of great and significant influence for the present and the future.

DEVELOPMENT OF THE EMBRYO. Harvey laid down the principle, in opposition to the views of those who believed in the doctrine of spontaneous generation, that all animals are produced from eggs (*omne vivum ex ovo*); and more recent researches have fully confirmed this view, if we are allowed to accept the modes of reproduction known as *gemmiparous* and *fissiparous*, or multiplication by buds and propagation by division, and the series of cases in which the offspring never resemble their parents, but the original form reappears in the second generation, and which are consequently said to present the phenomena of *alternate generation*. These exceptional cases occur only in very low forms of animal life, and, as a general rule, in retracing the phases of animal life, we arrive at an epoch in which the incipient animal is inclosed within an egg. It is then termed an *embryo;* and the modifications which this embryo undergoes before the young animal has an independent existence, are included in the general term which stands at the head of this article. Before embryology was properly studied, all animals were arranged under two great heads—the *oviparous*, which lay eggs; and the *viviparous*, which bring forth their young alive. We now know that viviparous as well as oviparous animals are produced from eggs—the only difference in this respect being, that their eggs, instead of being laid before the development of the embryo, begin to undergo their early changes in the body of the mother.

The egg has generally a more or less spherical form; the eggs of birds have, however, the form of an elongated spheroid, narrow at one end, and hence the origin of the word *oval*. Some eggs, as, for instance, those of certain insects (e.g., the podurella), are furnished with projecting filaments; others have a sculptured surface; and others, again, have peculiar forms, being cylindrical or prismatic. A simple sphere is, however, the normal form.

The egg originates within organs termed *ovaries*, peculiar to and characteristic of the female, except in those cases in which both male and female reproductive organs are associated in the same individual. These ovaries are glandular bodies, and are usually situated in the abdominal cavity. So long as the eggs remain in the ovary, they are very minute, and in this condition they are called *ovarian* or *primitive eggs*. They are identical in all animals, being, in fact merely little cells, containing yolk substance, in which is inclosed the germinative vesicle and the germinative dot. The yolk itself, with its membrane, is formed while the egg remains in the ovary; it is afterwards inclosed in another envelope, the shell-membrane, which may either remain soft, like parchment, or may be surrounded by calcareous deposit, as we observe in birds' eggs. The number of eggs seems to increase in proportion as we descend the animal scale, the eggs laid by a bird being far fewer than those laid by a fish, while these again are less than those laid by some insects.

The egg, when it has attained a certain degree of maturity, leaves the ovary. This step in the process is termed *ovulation*, and must not be confounded with the laying or

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deposition of the eggs, which is their subsequent expulsion from the abdominal cavity, through (in most cases) a special canal termed the *oviduct*. Ovulation takes place at a definite period of the year in most of the lower animals, and seldom until the animal has attained its full growth. In general, ovulation is repeated for a number of years consecutively, usually in the spring; sometimes, however, it occurs but once during life, as in most insects, which die soon after the process is accomplished.

After leaving the ovary, the eggs are either discharged from the animal, and undergo their further changes in the external world, or they continue their development within the body of the mother, as is the case in some fishes and reptiles (as sharks and vipers), which have consequently been named *ovoviviparous* animals; or, in the case of the mammalia, they are not only developed within the body of the mother, but, except in the case of the marsupiata and monotremata (q.v.), become intimately united to her by the intervention of certain temporary structures—namely, the placenta and umbilical cord. This mode of development is termed *gestation*.

The development of the embryo does not always take place immediately after the egg is laid, and a considerable time may elapse before it commences. Thus, the first eggs laid by the bird do not begin to undergo development until the whole number which is to constitute the entire brood is deposited; and the eggs of most insects are laid in the autumn, and remain unchanged till the following spring. During this time, the vital principle is dormant. See DORMANT VITALITY. In the case of birds and reptiles, a considerable degree of warmth is requisite for the process of development. In birds, the act of *incubation*, or "sitting," supplies the necessary amount of heat; and in reptiles, the eggs are hatched by exposure on sands to the sun's rays, by their being deposited in warm dunghills, etc.

In the composition and structure of a newly-laid hen's egg—and of course the description equally applies to the egg of any other bird—we have exteriorly the shell, whose hardness is due mainly to carbonate of lime, and which is lined by a double membrane, the shell-membrane; then there is an albuminous substance, the *white*, in which several layers may be distinguished; within this, we find the *yolk*, inclosed in its membrane; and in the midst of the yolk there was, before it was laid, a minute vesicle, the *germinative vesicle*, containing a still smaller one, the *germinative dot*. The most conspicuous of these parts—namely, the shell and the white—are not physiologically essential, and are wanting in the eggs of most animals lower than birds; while the yolk, the germinative vesicle, and the germinative dot, are found in the eggs of all animals; and it is from these parts, and these only, that the germ is formed. The *yolk* or *vitellus* is the most essential part of the egg. It is a viscid fluid, sometimes opaque and colored, as in the eggs of birds, and sometimes transparent and colorless, as in the eggs of many fishes and mollusks. The microscope shows that it is composed of an accumulation of granules and oil-vesicles. The yolk is surrounded by a very thin skin, termed the *vitelline membrane*. In some insects, this membrane forms the outer coat of the egg.

The *germinative vesicle* is a cell, situated in the young egg near the middle of the yolk; it contains one or more minute spots or nuclei, termed the germinative dots, which themselves contain smaller nucleoli. The *albumen* or *white* of the egg is a viscid and colorless fluid, which coagulates and becomes opaque on the application of a temperature of 146° F. Although it forms a large part of the egg of the bird, it is of very trifling importance in reference to the development of the embryo. It is not formed in the ovary like the yolk, but is secreted by the oviduct, and deposited round the yolk during the passage of the egg through that canal; hence, when there is no oviduct, the albumen is generally absent. In birds, it consists of several layers, one of which, forming the *chalazæ*, presents a coiled, rope-like appearance. The albumen in this part is thicker than that which lies more externally. The albumen is bounded externally by the *membrana putaminis*, or *shell membrane*, which splits into two layers, leaving a space at the broad end, filled with air; in birds, and in some reptiles, this membrane is covered by the calcareous shell; in most cases, however, it continues membranous, as in the eggs of the mollusks, most crustaceans, and fishes, frogs, &c.; and sometimes it is horny, as in the sharks and skates.

In order to understand the successive steps of embryonic development, we must remember that the whole animal body is formed of tissues, the elements of which are cells. See CELLS. While in the full-grown animal these cells have undergone such modifications as often hardly to present any indication of their primary form; in early embryonic life, the cells, which originate within the yolk, present a definite form and consistence. These cells we shall presently see become transformed into the blood, bone, muscle, etc., of the young animal. At the commencement of the process of development, the yolk, which previously was a mass of uniform appearance, gradually presents certain alterations. Some portions become more opaque, and others more transparent; and the germinative vesicle, which was in the center, rises to the upper part of the yolk, where the germ is to be formed. The yolk at the same time undergoes a peculiar process of segmentation. It is first divided into halves, forming distinct spheres, which are again continuously and regularly subdivided into two, till the whole or a part of the yolk assumes the appearance of a mulberry, and in known as the "mulberry mass." In fishes, the class of animals whose development we shall specially follow in this article, the segmentation is only partial, the divisions of the yolk not extending into its whole

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mass. This process leads to the formation of a *germ*, which usually rises above the yolk in the form of a discoid protuberance, which has received the various names of germinative disk, proligerous disk, germinal membrane, etc., and which is composed of minute cells. This disk enlarges till it embraces the whole, or very nearly the whole, of the yolk. At this early period, the germ consists of a single layer of very minute cells of uniform appearance; it soon, however, increases in thickness, and in vertebrate animals separates into various layers, which gradually become more and more distinct. The upper layer is termed the *serous* or *nervous layer*, and from it are subsequently developed the principal organs of animal life—such as the bones, muscles, brain and nerves, etc. The lower layer gives origin to the organs of vegetative life, and especially to the intestines and chylopoietic viscera, and is called the *mucous* or *vegetative* layer; the cells of which it is composed are larger than those of the serous layer. Between these layers there is, in the vertebrata, an intermediate layer, giving rise to the organs of circulation and to the first-formed blood, and hence termed the *vascular layer*.

At a very early period the germ undergoes modifications of form, varying with the department of the animal kingdom to which it belongs. Thus, in the articulata (insects, crustaceans, etc.), the germ is divided into segments, indicating the transverse divisions which occur in the adult animal; while the germ of vertebrate animals displays a longitudinal furrow, marking the position which the vertebral column and spiral cord are to occupy. The development of this furrow is highly important. At first, the furrow is very shallow, and a minute transparent band appears under it, called the *primitive stripe*. The walls of the furrow consist of two raised edges formed by a swelling of the germ on both sides of the primitive stripe. As these walls increase in height, their summits approach each other; and after a time they unite and convert the furrow into a closed canal, which is soon filled with a fluid from which the brain and spinal cord are subsequently formed.

The primitive stripe is gradually developed into a cartilaginous structure, termed the *chorda dorsalis*, which is the representative of the back-bone. In the meantime, the margin of the germ continues to extend over the surface of the yolk, until at length the latter is entirely closed in a cavity thus formed by the germ. In this lower cavity, the intestines and other organs of vegetative life are subsequently developed.

In all classes of the animal kingdom, the embryo rests upon the yolk, and covers it like a cap; but the direction by which its edges approach each other and unite to form the lower cavity, is very different in different kinds of animals, and is highly distinctive in reference to zoological classification. In all the vertebrata, the embryo lies with its face or ventral surface towards the yolk, and thus the suture or line at which the edges of the germ unite to enclose the yolk, and which in mammals forms the navel, lies in front. Another suture is found along the back, arising from the folding together of the upper surfaces of the germ, to form the dorsal canal. In the affection known as *spina bifida*, this suture is incomplete. In the articulata, the embryo lies with its back upon the yolk; in the cephalopoda, the yolk communicates, as in the vertebrata, with the ventral surface of the body, but no dorsal canal is formed in them; and in the other departments of animal life, we find special and characteristic relations between the embryo and the yolk.

The development of the embryo of vertebrated animals is best observed in the eggs of fishes, as from their transparency they do not require to be cut open; and with due care the whole series of embryonic changes may be observed upon the same individual, and the succession of appearances of the different organs may be ascertained. Prof. Agassiz has carefully examined and depicted the principal phases of development in the white-fish, which belongs to the salmon family, and we shall endeavor to give his chief results. The egg when laid is spherical, about the size of a small pea, and nearly transparent. It contains no albumen, and the shell-membrane and the membrane of the yolk seem fused into one. In a few hours after it has been laid, provided it has come in contact with the fecundating fluid of the male, a separation between these two membranes takes place, in consequence of the absorption of water, by which the size of the egg is increased. Between the shell-membrane and the yolk there is now a considerable transparent space, corresponding in position to the albumen of birds' eggs. Oil globules are scattered through the yolk, but soon arrange themselves in a stratum or disk towards the upper part, where a swelling, in the shape of a transparent vesicle, begins to show itself. It is composed of very delicate and minute cells, and is the germ in its earliest stage. As the germ increases, and has a larger surface in contact with the yolk, we notice a depression on its upper part, and soon after a second furrow appears at right angles to the former, so that the germ now presents four elevations. A continuous subdivision of this nature goes on during the second and third days, until the germ is divided into numerous minute spheres, which form what is termed the mulberry mass. This appearance, however, does not long continue; at the end of the third day, the fissures disappear, and the germ continues to extend as an envelope around the yolk, which it at last entirely incloses.

On the tenth day, the first outlines of the embryo begin to appear, and we soon distinguish in it a depression between two little ridges, whose edges approach till they form a canal. At about the same time, an enlargement at one end of the furrow is

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observed, which is the rudimentary head, in which may soon be distinguished traces of the division of the brain corresponding to the organs of sight, hearing, and smell.

Towards the thirteenth day, we see a transparent cartilaginous cord (the *chorda dorsalis*) in the position afterwards occupied by the backbone, composed of large cells, in which transverse divisions are forming. In some fishes, as the sturgeon, this cartilaginous or embryonic state is persistent through life, and no true osseous vertebral column is ever formed. The rudiments of the eye soon appear in the form of a fold in the external membrane of the germ, in which the crystalline lens is afterwards formed. At the same time we see at the posterior part of the head an elliptical vesicle, which is the rudimentary ear. At this period, the distinction between the upper (serous) and lower (mucous) layers of the germ is best traced; all the changes which have been mentioned occurring in the upper layer.

At or soon after the seventeenth day, the lower (or mucous) layer separates into two laminæ, the inferior of which becomes the intestine. The heart at about the same time appears in the form of a simple cavity, in the midst of a mass of cells belonging to the middle or vascular layer. As soon as the cavity of the heart is closed in, regular motions of contraction and expansion are observed, and the movement of blood-corpuscles within it is seen.

It is not till the thirtieth day that any traces of a circulation of the blood are manifested; we then notice two currents, one running towards the head, and the other towards the trunk, with corresponding returning currents. The traces of the liver are now seen. The embryo begins to liberate itself at both extremities from the yolk, the tail first becoming free, and moving in violent jerks.

The embryo, although still inclosed in the egg-membranes, now unites all the essential conditions for the exercise of the functions of animal life: it has a brain, an intestine, a pulsating heart, and circulating blood, and a limited amount of spontaneous motion; but the forms of the organs are still incomplete, nor have they acquired the precise shape characterizing the class to which it belongs. The embryo is as yet only a vertebrate animal in general, and might be taken for that of a frog as well as for that of a fish.

Towards the close of the embryonic period, after the fortieth day, the embryo acquires a more definite shape: the jaws protrude; the nostrils approach the end of the snout; divisions are observed in the fin-like structure which surrounds the body; the anterior extremities, which were mere knobs, become rudimentary pectoral fins; and, finally, the gill-openings appear, so that the fish-type is now obvious. In this state, the young white fish escapes from the egg about the sixtieth day after it is laid; but its development is still incomplete. We cannot yet tell to what genus the fish belongs. The gill-covers are not yet formed, there are no teeth, the mouth is below instead of at the most projecting part of the head, and the fins have no rays. The remainder of the yolk is suspended from the belly in the form of a bladder, but it daily diminishes in size, till it is at length completely absorbed by the animal. The duration of these changes varies extremely in different fishes; some accomplish them in a few days, while in others, months are required.

In frogs and all the naked reptiles, the development is very similar to that of fishes; in the scaly reptiles (snakes, lizards, turtles), and in birds, there are peculiar membranes surrounding and protecting the embryo during its growth, termed the allantois and the amnios; and in mammals there are additional complications of structure, which it would be impossible to describe clearly without occupying more space than could be allotted to a subject of this nature. For further information on this subject, we may refer to the various writings of Agassiz, especially his *Lectures on Comparative Embryology*, and his *Comparative Physiology*, from which this article is mainly drawn, and to Carpenter's *Comparative Physiology*.

DEVELOPMENT IN PHOTOGRAPHY, the process which immediately follows exposure, and which renders the picture visible in all its details. It consists in the precipitation or deposition of *new material* on that portion of the sensitive surface which has been acted on by light; the same principle therefore prevails in all processes. See PHOTOGRAPHY.

DEVELOPMENT THE'ORY. See SPECIES.

DEV'ENS, CHARLES, JR., b. Mass., 1820; graduated at Harvard, and admitted to the bar in 1841. He was a member of the Mass. state senate; U. S. marshal for the district of Mass.; in the union army during the civil war, being several times wounded; associate justice of the Mass. Supreme Court; '80, U. S. attorney-general. Died, 1891.

DEV'ENTER, a thriving t. of Holland, in the province of Overyssel, situated on the Yssel, about 55 m. e.s.e. of Amsterdam. Tower-flanked walls surround D., which is further defended by a broad, deep ditch. The streets are narrow, but the market-places spacious. The principal buildings are the cathedral—a structure in the early Gothic style—the town-house, the court-house, and prison. From the ramparts, which are used as a promenade, there is a commanding prospect. The industry of D. consists in iron-founding, the manufacture of carpets, stockings, etc. Its gingerbread (called *Deventer koek*) is celebrated. There is a large trade in grain, etc. Pop. 1890, 23,220.

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DE VERE, AUBREY THOMAS, Irish poet, was b. Jan. 10, 1814, third son of sir Aubrey De Vere, the second baronet of Curragh Chase, co. Limerick. He had his education at Trinity coll., Dublin, and first appeared as a poet in 1842 with *The Waldenses, or the Fall of Rora; a Lyrical Tale.* Next year his *Searches after Proserpine* made him widely and favorably known as a writer of verse, graceful, refined, and fluent, if somewhat feeble and lacking in genuine inspiration. Later vols. are *Poems, Miscellaneous and Sacred* (1853); *May Carols* (1857); *The Sisters; Innisfail* (1861); *Irish Odes and Other Poems* (1869); *The Legends of St. Patrick* (1872); *Legends of the Saxon Saints* (1879); and *The Foray of Queen Meave and Other Legends of Ireland's Heroic Age* (1882). Mr. De Vere has also published poetical dramas on Alexander the Great (1874) and St. Thomas of Canterbury (1876), *Essays Chiefly on Poetry* (2 vols. 1887), *Religious Poems of the Nineteenth Century* (1893), and other works on Irish ecclesiastical politics and literary criticism.

DE VERE, MAXIMILIAN SCHELE, LL.D.; b. Sweden, 1820. He was in the Prussian diplomatic service, but came to the United States and was appointed to the chair of modern languages in the university of Virginia, 1844. Among his works are *Outlines of Comparative Philology; Stray Leaves from the Book of Nature; Studies of our English; The Great Empire; Wonders of the Deep; Americanisms; The English in the New World;* etc. D. May, 1898.

DEVEREAUX See ESSEX, EARL OF.

DEVIATION OF THE PLUMB-LINE, an effect observed near cliffs or mountains, which seems to show that the attraction of masses of earth deflect a perpendicular line. Similar effects have been observed on plains, whence it is argued that there must be hollows underneath, or masses of earth of different degrees of density.

DEVICE—from the middle-age Lat. *divisa*, a drawing or design—is a motto expressed by means of a pictorial emblem. The motto proper originated in the emblem, a written inscription coming to be added to the pictorial design, with the view of rendering the meaning more explicit. Devices thus consist of two parts—a pictorial figure called the "body," and a motto in words called the "soul" of the device. As early as the times of Æschylus, the "seven heroes before Thebes" all appear with devices on their shields; and the same is related by Xenophon of the Lacedæmonians and Sicyonians. In the middle ages, devices on coat-armor came into regular and formal use, and chivalry employed them in its courtly expressions of devotion to the fair sex. They were used both as charges on the shield and as crests. The only respect in which the device differs from other heraldic emblems is, that it has always some specific reference to the history, or circumstances, or position of the bearer. As an example: Louis XIII. of France had a falcon as a device, with these words: "*Aquila generosior ales*" ("A more generous bird than the eagle"), by which he meant to denote his own superiority to the emperor, whose device was an eagle. Devices, moreover, were generally borne only by the individual who assumed them, and not by the other members of his family or his descendants, like the crest or cognizance. They were often contrived to typify a special enterprise, the general character of the wearer, or even to designate his name—as the *mulberry* trees in the embroidered trappings of the horse of Thomas Mowbray, duke of Norfolk. On all festal occasions, they figured on triumphal arches, on banners and hangings. At a later period, it became customary to work devices into buildings; friezes and stained windows were often covered with them. This practice has recently much gone out, at least, in its original form. See Radowitz's *Die Devisen und Motto des spätern Mittelalters* (Stutt. 1850).

DE VIGNY, ALFRED VICTOR, Comte, 1799–1863; b. France; poet and novelist. Having been in the army 13 years without seeing active service, he resigned. He had already published several poems, and being in pecuniary ease (having wedded a rich English lady) he started in earnest on his poetical career contemporaneously with Victor Hugo and Lamartine. De Vigny published a volume in 1822, and in 1824 came *Eloa*, a poem of delicate fancy, the story of a "sister of the angels." Soon afterwards he published *The Deluge; Moses; Dolorida*, etc. In 1826, appeared *Cinq Mars*, a historical romance of a conspiracy under Louis XIII. This had great success. In 1829, he translated *Othello* for the Parisian stage, and in 1835, made a drama of the romantic life of Chatterton, the English boy-poet. His best prose work is *Stello ou les Diables bleus*, issued in 1832. His last effort was *Poëms philosophiques, ou les Destinées*, part of which was published after his death.

DEV'IL, or SA'TAN (Gr. *diabolos*, "false accuser;" Heb. *satan*, "adversary"), designates in the Old and New Testament a mighty spirit of evil who has, during unknown ages, ruled over a kingdom of evil spirits, and is in constant and restlessly active opposition to God. This belief, however, was very gradually developed in the Jewish mind; and it is beyond all question, that it acquired clearness and prominence through extra-national influences. In England, the "doctrine of Satan" has hardly received any critical treatment at the hands of scholars; but in Germany, the subject has been most learnedly investigated. The conclusions at which some of the profoundest Biblical scholars of the continent have arrived, and even the principles on which they proceed,

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may be rejected by us, but a brief account of their method of historical analysis may be neither uninteresting nor uninstructive. The older Hebrews, it is said, who lived before the period of the Babylonish captivity—judging from the silence of Scripture—knew nothing, and certainly taught nothing, of evil spirits in the later sense—i.e., of beings separated from God, who were evil in the essence of their nature, and worked evil only. *Moral* evil was rather looked upon as properly the act of man; *physical* evil, or adversity, on the other hand, as punishment merited through sin, and inflicted by a just and holy God, who was thus necessarily conceived as the true source of all calamity. The angels who foretold God's purposes, and executed his will, however great might be the physical evil they occasioned, are never accused of *moral* evil. Even in the Mosaic account of the seduction of Eve, there is nothing to induce us to believe that the author regarded the serpent other than as "the most subtle of all the beasts of the field," or that he meant to conceal under so plain a statement an allusion to Satan. It is probable, however, that at some early period in their history, the popular faith of the Jews, partly divorcing itself from its grand religious conceptions of the "one living and true God," and lapsing—as has everywhere been the case with the popular faith—into petty superstitions, had become familiar with the idea of certain fearful unearthly beings haunting wildernesses, similar to the fauns and satyrs of Greece, who might form the connecting-link in the later development of an actual demonism. Traces of this are clearly visible in the Pentateuch. The Hebrew word *seirim*, occurring in Leviticus xvii. 7, which our translators have rendered "devils," means only "hairy ones." Now, the Egyptians worshiped the *he-goat*, and the Hebrews partook, as we know, of their idolatry. Therefore Moses in this verse, forbidding them to commit this sin in future, says: "They shall *no more* offer their sacrifices to *seirim*—i.e., to the Egyptian he-goats. The development of demonism was materially furthered during and after the Babylonish captivity by Medo-Persian influences. In those canonical books of the Old Testament which belong, in their present form, to the post-exilian period—i.e., the period subsequent to the exile—the Jewish conceptions of angels become more definite. They possess different ranks, names, and specific offices. They are the tutelary guardians and helpers of particular lands and peoples, but are everywhere in absolute dependence on God. And now we meet also, for the first time, with an angel called *Satan*, who, however, still figures as a minister of God, and along with the others appears in heaven before the throne of Jehovah, but with the function assigned to him of accuser and seducer. It is he who—1 Chron. xxi. 1 (*Chronicles*, it should be mentioned, is considered by most critics, both orthodox and heterodox, to be the composition of Ezra, and therefore *post-exilian*)—stirs up David to number the people; while in the older Hebrew version (2 Sam. xxiv. 1) the same act is attributed to an angry God, the conception of Satan not *then* having clearly, if at all, presented itself to the Hebrew mind. It is Satan also who throws suspicion on the piety of Job, and with the permission of Jehovah, causes a series of misfortunes to befall him; while in Zechariah iii. 1, he is represented as "resisting" the angel of God, and as a false accuser of the high-priest Joshua. As yet, however, an evil nature is not *expressly* ascribed to him, but, what is much the same, it is assumed that he takes a pleasure in active evil. It is a purely arbitrary and untextual interpretation of Isaiah xiv. 12 ("How art thou fallen from heaven, O Lucifer, son of the morning!") that would force these words to refer to the fall of the D., or determine from them his name. In the Apocrypha, of which only a small part is Palestinian, the rest being either *Chaldaico-Persian* (as, for example, *Tobias* and *Baruch*) or *Ægypto-Alexandrian* (as, for example, *Wisdom*) in its origin, the older Hebrew doctrine of misfortune coming from the angel of Jehovah is, so to speak, dismembered, and demons or evil spirits, in the New Testament sense of the term (*pneumata ponēra*), are for the first time mentioned (and in *Tobias* and *Baruch* frequently) as the authors of calamities. According to the representations of these writings, the evil spirits dwell, like the older Hebrew hobgoblins, in waste places, but associate themselves for the injury or destruction of men, enter into them as tormentors, and can be expelled only by magical or mysterious means. To this class of beings the heathen deities were reckoned to belong. But even here there is no mention of an *organization* or kingdom or prince of demons. The first trace of a *Diabolos* or D. proper (and one in all probability springing from a foreign source) shows itself in the Book of *Wisdom* (ii. 24), in relation to the seduction of Eve, where it is said that through the D. the necessity of death has come into the world.

In the period elapsing between the close of the Apocrypha and the appearance of Jesus, the Jewish ideas of angels, as well as of demons and the D., received an extensive development. This angelology and demonology, wholly foreign to the older Hebrew religion, was derived in all its essential characteristics from the system of Zoroaster, with which the Jews had become familiar by their long and close intercourse with the Persian empire during the exile, and subsequently. It was, however, impossible to transfer the *dualism* of Zoroaster into a creed so purely *monotheistic* as that of the Jews; this would have destroyed the foundation on which their entire history rested. Two beings, equally eternal, equally powerful, was an idea which no Hebrew—mindful of the glorious deliverance of his forefathers out of the land of Egypt, of the law given amidst the thunders of Sinai, of the manna in the wilderness, of the triumphs in Canaan, and the golden psalms of David—could for one moment entertain. But, on

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the other hand, now that as a nation the Jews were become weak and of little account, hemmed in, and crushed by mighty and advancing empires, no conception could seem more true, or prove more consolatory, than that which permitted them to attribute their misfortunes to the agency of a demoniacal race, headed by a potentate only inferior to Jehovah himself. They could now believe that God had not forsaken his "chosen people." Thus, the dualism of Zoroaster suggested the kingdom and royalty of Satan, but the doctrine shaped itself in harmony with the national monotheism. The D. and his demons were represented as having been originally *angels*, who had fallen from their "high estate," been punished by God, and had therefore assumed a position of hostility, without, however, being able to materially frustrate the divine purposes. These opinions found an almost universal reception among the people, as well as among those Jewish theologians who, along with the Mosaic law, held oral tradition to be an authentic source of religious doctrine. Indeed, the only Jewish sect which rejected them, was that of the Sadducees, who considered them, as also the doctrines of the resurrection from the dead, of the Messiah, of the Messianic kingdom, of the last judgment, of rewards and punishments, and of angels and demons, to be new, outlandish anti-Mosaic myths and theories. This conflict of opinion among the Jews prevented their ideas of the D. and demons from obtaining, in spite of their broad diffusion, a dogmatic and systematic stability. The populace and the Pharisees believed fervidly in the existence of such evil spirits; but their conceptions had not only all the heat, but all the confusedness of superstition.

In this condition were the Jews when the New Testament lifts up the veil of oblivion that had partially dropped on the face of the nation more than two centuries before, and the light of history again falls brightly on its features. We now find a swarm of demons in Palestine. These unclean spirits, however, can be exorcised. When expelled from the soul of the demoniac, their proper home is "the abyss" (*Eis ten abusson*, Luke viii. 31). According to the popular conceptions, therefore, we must suppose their dwelling to be a dark subterranean region, although, like the demons of the Old Testament, they inhabit also the earth and the air. They were not, as the Greeks and Josephus thought, the evil spirits of dead men, but had angelic natures (see Matt. xxv. 41), and formed a society governed by a chief, called Satan, Devil, Beelzebub, Belial, etc. He is now firmly seated in the popular imagination as a fallen angel; but as yet there is no hint of his having seduced his followers from their allegiance to Jehovah, or of their having fallen at the same time. This idea first appears in the book of Revelation, chap. xii., where mention is made of a great war in heaven between Michael and his angels on the one hand, and the D. and his angels on the other. "And the great dragon was cast out," says the writer, "that old serpent, called the Devil, and Satan, which deceiveth the whole world: he was cast out into the earth, and his angels were cast out with him." Whether or not these popular conceptions of the D. and his influence were materially or spiritually interpreted by Christ himself, it is impossible to say. He may either have accommodated his language to suit the popular mode of realizing the power of evil (a supposition which involves nothing unworthy of his sinless character), *or* (for this is the only other hypothesis compatible with a belief in his divinity) he may have intended to recognize the essential truth of that doctrine of an evil personality which the Jews derived from, or, at all events, developed under the inspiration of Zoroastrian ideas.

But whether Christ meant to accommodate his language to the popular conceptions or not, the primitive church assumed the personality of the D. as an unquestionable fact. The New Testament ideas on this point were not only greatly enlarged, but in many respects entirely changed, partly through the introduction of a considerable number of heathen notions, and partly through the dogmatic tendencies of the time, in consequence of which the various statements in the Bible regarding Satan and evil were *uncritically* and *unhistorically* heaped together, and a doctrine of Satanic agency elaborated *logically* but not *theologically*. Holding firmly to the belief of a Satanic kingdom of darkness opposed to Christ's kingdom of light, the majority of the early Christians ascribed all evil, physical as well as moral, to the D. and his demons; failures of the crop, sterility, pestilence, murrain among cattle, mental maladies, persecutions of the Christians, individual vices, heresies, astrology, philosophy, and especially the whole body of heathenism, with its mythology and religious worship. The heathen gods were believed to be conquered by the work of Christ, but not to be wholly powerless; they sank down into demons, and so a part of their mythology passed into the doctrine of the Devil. It was they who, as demons, meaning to deceive, uttered oracles, were present at sacrifices, and inhaled the sacrificial incense, whereby the notion gained ground that the demon-nature was ever growing more and more sensual and materialized—a notion that reacted again on the conception of hell, which soon began to be painted in coarse, earthly colors, blazing with eternal fire, through which blackened devils and scorched souls flitted in endless torment. From the gross materialism that now vitiated all conceptions of the D. and of demons, sprang the loathsome belief, common enough in the early church fathers, but during the middle ages exhibiting itself only in the superstitions of the vulgar—viz., of the carnal intercourse of devils with women. See WITCHCRAFT.

Concerning the fall of the "devil and his angels," opinions were long diverse. Some

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supposed that it occurred through envy; others, through pride; and others again, through concupiscence and excess; some placed it before, and others after the seduction of Eve by the serpent. Several of the fathers (for example, Augustine) believed that man was created to fill up the gap which had been caused in the kingdom of Christ through the apostasy of Satan and those whom he had led astray. Meanwhile, the idea of the importance of the death of Jesus had been dogmatically elaborated. At first, Christians saw in that death a sacrifice, and in his blood a propitiatory power; but soon after, their thoughts reverted to the other scriptural representation of an actual victory over the D., a restoration of the Divine image in man, and the source and condition of holiness; whence was developed a very wonderful dogma concerning the devil. God having declared that whoever should transgress his law, should incur death and damnation; and man having done so, God's justice and veracity compelled him to keep his word. But inasmuch as Eve was beguiled into transgression, and fell as it were unwittingly, it did not seem for the honor or good of the Deity that rational beings, partakers also of his own spirit, should be lost through a trick of the fiend; wherefore Jesus offered himself to the D. as a ransom for the souls of men. The D. thinking "the *man* Christ Jesus" of more value than all the rest of the race put together, closed the bargain immediately. But deceived in his turn by the "appearance of flesh," he did not recognize the Deity concealed beneath it; and not being able to retain the latter (shrinking from it, in fact, horrified and dismayed) he lost *both*—Christ and man. The D. was, however, *actually* deprived only of Christians, in all other men he dwelt and ruled through the force of original sin. In consequence of this he was formally "banished" (until the 8d c.), not only from "demoniacs," but also from all converts from Judaism and heathenism to Christianity; and when the practice of baptism had shaped itself into the dogma, that it was "a necessary preliminary to holiness," exorcism, or "driving out the devil," became a Christian "art," exercised on all new-born children. Those who died unbaptized, were (by that ruthless logic that frequently marks a barbarous theology) sent to hell; for although *potentially* Christ's, the church had not yet rescued them from their satanic master, by the appointed rite, and so the conditions being unfulfilled, the D. carried off his prey. Yet the heart of humanity, stronger in its simple instincts than the most iron creed ever hammered out of the human brain, showed its holy presence even in so fearful a dogma; and although it could not deliver the lost infants from the region of eternal fire, it assigned them less painful pangs, and a less dreadful dwelling-place. But while the power of the D. over all not guarded by Christian faith and rites, was supreme; over those who were so guarded it was utterly weak. No Christian, not even the weakest, could be *forced* by him to do evil. Thus far had the "doctrine of the devil" been developed at the 8th c., and at this point it has essentially remained in the eastern or Greek church; but in the western it took yet another development. This was mainly occasioned by the writings of Pope Gregory the Great, who partly took up the popular notions himself, infused into them other then prevalent theological opinions, and elevated the result of the incongruous mixture to the dignity of Church doctrine. He calls the D. a "stupid beast," because he hopes for heaven, without being able to reach it, and entangles himself in his own net; but on the other hand, he admits him to have a *potentia sublimitatis*, and utters the profound idea that he cannot comprehend our thoughts. In these three notions lie the essential germs of the Germanic Faust-devil. The old German and Norse mythologies poured a flood of heathen fancies into the "doctrine of the devil." Even Ulfilas, at a much earlier period, had translated the New Testament word *daimon* or *daimonion* by *unhulthô*, i.e., she-devil or sorceress, because the old Germans believed in *female* demons, while the Christain *usus loquendi* contains no trace of such. The peculiarly German conception of a now malignant, now gentle *female* lives to this day in the German phrase, "The devil is beating his mother" (when rain and sunshine quickly alternate). In England and Scotland, too, the phrase is, or recently was current, "The devil and his dam." The Germans have also the proverb, "Where the devil cannot come, there he sends his grandmother." Soon, however, the word *diabolus*, in violation of the New Testament distinction between it and *daimon*, came to signify devils of every or any sort. The Gothic form of the word was *diabulus, diabaúlus;* old Saxon, *diubhul, diubhal, diobol;* old High German, *diufal, tieval, tiubil*, etc. The dwelling of the D. was, of course, hell, which, however, according to old Germanic and Scandinavian notions, was placed in the dreary regions of the north. Although his mischievous powers are to be pretty well controlled till the coming of antichrist, when he expects to hold carnival, yet, like the ancient gods and demons, he occasionally appears on the earth. He then assumes at times a purely human form, but, like Vulcan, who was thrown down from heaven like himself, and the smith Wieland, of German mythology, he is somewhat lame. He is covered with a gray, green, or red cloak, like the Kobolds and dwarfs (see GIANTS AND DWARFS), (the spirits of the suppressed heathenism): sometimes, also, he appears black and sooty, as befits his dwelling-place, and his opposition to a pure God. But as the old deities, both classical and German, possessed the power of transformation to a most remarkable degree, the D., through his relationship with these, inherited this power when they vanished from the scene. The form he most frequently assumed was that of an animal, approximating, in this respect, to the German forest-spirits and the Greek satyrs and fauns. At one time he shows the foot of a horse or goat with horns and tail; at another, he appears as a black horse, a he-goat, a

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hog, a wolf, a hell-hound, a raven, a serpent, a worm, a dragon, or a fly. The conception of the power of the D. was vastly enlarged by the influx of these new fancies. In fact, it rose almost to a new dualism; but on the other hand, also, many mild and friendly *traits* of the heathen gods passed over into the popular conception of the D., and gave to his nature a quite new, humorous, and even merry side. As, after the introduction of Christianity, offerings were still occasionally made to the old gods, the D. shared in these honors. A horse, a he-goat, or a hound was at times sacrificed to him; and to the present day the expression has survived, "To kindle a fire for the devil"—obviously an allusion to altar-flames. Various features of the old Norse gods, especially of Loki and Donar (Thor), the gods of fire and thunder, were also transferred to him. Hence the still current phrases in Germany when thunder is heard: "The devil must be striking," and "The runaway goose is gone to the devil." (*Donner*, "thunder," is the word used for devil in this case.) Every power, too, which, according to the older heathen belief, was lodged in the lesser demons, giants, etc, had now its proper center in the great fiend himself, who could perform all the pranks attributed to the more grotesque creations of the Norse mythology, and work all the evil of the more malignant spirits; but, in general, these beings were rather pressed into his service than absorbed by him, or incarnated in his person.

So did this great, originally Persico-Judaic belief spread itself through all Christian lands, incorporating with itself, first, the kindred conceptions of the ancient classical world, and, ultimately, the rich and varied superstitions of our Teutonic and Scandinavian forefathers. Thus decked out in the costume of many different climes and ages, the image of evil passed into the light of the modern world. Every step forward that it now took robbed it of some potent spell that used to chill the blood and strike the heart with awful horror. Men first lost faith in the D.'s occasional incarnation; then medical science destroyed his claims to the origination of mental phenomena, which he was once supposed to have directly caused; natural science deprived him of his control over the elements; historical criticism plucked from him his borrowed feathers; while metaphysics and a deeper religious exegesis have combined, not, perhaps, to annihilate his personality or deny his influence, but certainly to realize the former under a more spiritual form, and to limit the latter by a reverential belief in the wisdom and goodness of God. See Mayer's *Historia Diaboli* (1780); Horst's *Dæmonomagie* (1817) and *Zauberbibliothek* (1826); and Grimm's *Deutsche Mythologie* (2d edit. 1844); also Moncure Conway's *Demonology and Devil Lore* (1878).

At the outset of this article, it was stated that the "doctrine of the devil" had received little critical treatment from English scholars. The following appears to be the prevalent mode of regarding the subject in that country. The doctrine of the existence of a personal D., the chief of evil spirits, and directly or indirectly the author of at least all *moral* evil, is maintained by reference to the Bible, regarded as containing one revelation of truth harmonious in all its parts, and gradually developed. The Scriptures of the Old and New Testaments being thus regarded, and the supposition of conflict between the doctrines of their different books, or of error in any of them being rejected as inconsistent with a full recognition of their inspiration and divine authority, the doctrine in question is unavoidably deduced from them. It is assumed to appear in the narrative of the fall in Genesis, and the name *serpent* is again applied to the D. in the book of Revelation, where he is described as "that old serpent . . . . which deceiveth the whole world" (Rev. xii. 9); he is believed to be repeatedly mentioned in the Old Testament. The hypothesis of an extra-national origination and development of the idea of the D. would, of course, be repudiated, and orthodox divines would consider it more probable that the Persians borrowed from the Jews than that the Jews borrowed from the Persians. The mention of the D. in the New Testament is held to be conclusive, not only of his existence, but of the belief in that existence (even when not expressed or hinted at) among the older Jews. The warnings and exhortations addressed to Christians are, it is also said, framed on the supposition of dangers arising from his violence, power, and subtlety. It is further argued, that the principal objections urged against the doctrine of the existence of a D. are substantially the same which present themselves to the mind as difficulties when we speculate on that which, however, is so undeniable—the existence of moral evil.

DEVIL-FISH, a name given by fishermen along the southern Atlantic and gulf coasts of the United States to a cartilaginous fish of the ray family, *ceratopterus vampirus*, Mitch. The outline of the fish is nearly an isoceles triangle, the apex at the tail, the altitude of the triangle, or length of the fish, being about half the breadth, from tip to tip, of the pectoral fins. Specimens are described as 10 ft. long, 22 ft. wide, and weighing 4 or 5 tons. A mounted specimen is in the museum of the Chicago academy of sciences. It is a small fish of the kind; 5½ ft. long, 11 ft. broad, 18 in. thick at about 2 ft. behind the mouth; and probably weighed 700 lbs. when alive. The skin is thin and rough, like that of a shark; color, slaty-black above, creamy-white beneath, but darker along the edge. The head, slightly protuberant along the base of the triangle, is retracted; mouth large and cavernous; nostrils near the angles of the mouth, in the under surface of the upper jaw; eyes protruding at the side of the head; ears, or auricular openings which serve the purpose, a little to the rear of the eyes. The mouth

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is armed at either side by a flat cartilaginous protuberance, in the specimen mentioned about 12 in. long, and of the breadth and thickness of a man's hand; in life, the creature can twist this into a cone, which resembles a horn, whence the part *cera* in the generic name. These members, perhaps, act like hands in sweeping food into the mouth. There are 5 large, linear, brachial openings on each side of the under surface, in the rear of the lower jaw. The tail is very slender, like a whip-lash, four-sided, and so rough that a lash received from it would cut to the bone. The stomach of this fish contained about two bushels of partly digested algæ, of a species which grows abundantly in southern waters. The evidence is against the supposition that it consumes any considerable quantity of animal food. See CEPHALOPTERA.

In his *Travailleurs de la mer*, Victor Hugo gives a thrilling account of a nameless and horrid monster which he calls *pieuvre*, a word rendered by his translators "devil-fish." The celebrity of the narrative has attached the name to the creature there described, but which does not really exist as pictured by the novelist. The account most nearly fits the cephalopodous mollusk called the *poulpe* (q.v.), which grows to a large size in tropical waters.

The name is also given to a fish better known as the angler (q.v.), *lophius piscatorius*, and by ignorant fishermen to various other fishes of grotesque appearance.

DEVILLE, ÉTIENNE HENRI SAINTE-CLAIRE, 1818–81; b. St. Thomas, in the Antilles. He was educated in France, and on leaving college, constructed for himself a chemical laboratory in which for 9 years he conducted patient researches without either companion or instructor. In 1845 he became dean and prof. in the college at Besançon, and he afterwards occupied chairs at the Normal school and the college of science in Paris. He was the discoverer of anhydric nitric acid and of the principle of chemical "dissociation;" and contributed many valuable monographs to the *Annales de Chimie et de Physique*.

DEVIL'S ADVOCATE. See ADVOCATUS DIABOLI.

DEVIL'S BRIDGE, in Switzerland; a curious bridge over which the road to Italy crossed the Reuss. The original bridge, built in 1118, was partially destroyed by the French in 1799. It was restored, but is no longer in common use. "The Hole of Uri" is the name given to a tunnel near the bridge, through which the road passes.

DEVIL'S DOZEN. See BAKER'S DOZEN.

DEVIL'S DUST, the name sarcastically given to old woolen materials manufactured into some variety of cloth. See SHODDY.

DEVIL'S PARLIAMENT, THE, was a Parliament convened by Henry VI., to meet in Coventry in 1459. It was so called for having attainted the Duke of York and his adherents of high treason.

DEVIL-WORSHIPERS, or YEZIDEES, a sect in Koordistan and Armenia, numbering about a quarter of a million. They respect the devil, and look for him to be restored to heaven, at which time they desire his friendly services.

DEVISE, in law, the disposition of real property by will. The word is used either as a verb or a noun, and in the latter sense is sometimes applied to the particular clause of a will making the gift of real property. *Devise* is legally restricted to testamentary disposition of real property as distinguished from the word *bequeath*, used of personal property. When both kinds of property are conveyed together by will the word devise may be used. It has been held by the courts that the meaning of the word may be extended to include personal property, when this was the evident intention of the testator, as shown by the context. Any estate or interest in real property may be devised, whether it be of a legal or equitable character, or even executory, if it be one which can descend to the heir. The estate of the devisee vests immediately upon the testator's death. The right of devise of real estate is not absolutely unlimited. In the United States homesteads are generally not devisable without condition and sometimes dower estates are not. An *executory devise* is the creation by will of a future interest or estate in real property contingent on a certain event but not preceded by a freehold estate created by the same will. Like other executory estates devises of this kind are governed by the rules laid down in the Statute of Uses. The full power of creating future estates by devise is limited by the law forbidding perpetuities, which allows only the creation of estates taking effect at a time not further distant from the date of the grant than a life or lives in being and twenty-one years after such life or lives have ceased (together with the usual period of gestation). In its derivation the word devise is kindred with the Latin *divido*, and in its early use meant any division of lands. Historically speaking, the present power of devise real estate is of comparatively recent origin. It did not exist under the feudal system, although in England before the time of the Conquest lands could be conveyed by will. When the system of conveying land "to uses" arose, to avoid the difficulties put in the way of free transfer by feudal ideas, it was extended to the conveying of land by will. This was in the time of Henry the Eighth, specially forbidden, however, by statute, but was soon restored with certain limitations. By statutes of this century devises of land are placed on the same footing as other dispositions of property by will.

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DEVISEE. One to whom property is devised.

DEVI'ZES (anciently *Divisæ, Divisis, De Vies*), a parliamentary and municipal borough, in the middle of Wiltshire, near the Avon and Kennet canal, 22 m. n.n.w. of Salisbury. It lies high at the mouth of Pewsey vale, between the thinly peopled tracks of Salisbury plain and the Marlborough downs. Pop. '81, 6,645. D. returns one member to parliament. It has silk-throwing mills, and manufactures of snuff and malt, and is the seat of one of the most important corn-markets of the w. of England. The corn exchange has standing-room for nearly 3,000 persons. The chancel of St. Mary's church in D. is believed to be nearly as old as the conquest. Roman household gods and coins have been found here. D. arose in a castle built by Roger, bishop of Salisbury, in the time of Henry I. This castle, of which only the walls of one of the dungeons remain, was besieged and taken by Cromwell in 1645. From the time of Henry VIII. till about 1820, D. was the seat of extensive cloth manufactures.

DEVOIRS OF CALAIS were the customs due to the king for merchandise brought to, or carried out of, Calais while in the possession of England.—*Cowel's Interpreter.* "Merchants of the west may buy merchandises, so that they find sureties to carry them to the west or to Calais."—2 Rich. II. st. 1. c. 3.

DEVO'NIAN FORMATION. (See DEVONIAN SYSTEM.) At the beginning of the Devonian period the dry land of North America was confined to the present territory of eastern Canada and New England. The Alleghany mountains were sketched in a series of islands and coral reefs which made a barrier between the ocean and the inland sea. There were no large rivers; the valleys of the Hudson, the Connecticut, and the St. Lawrence were merely outlined, and the Ottawa had begun its work in the azoic region between the St. Lawrence and Labrador. The Devonian period was occupied by a series of oscillations of level, the amplitude of the variations, and the consequent thicknesses of deposit being greater in the eastern part. The mediterranean of the interior opened s. into the gulf of Mexico, n. into the Arctic sea, and covered all the northern central region of the present continent with shallow lagoons, separated by low sandy areas.

According to the geologists of the New York survey, the D. F. of America is arranged thus, beginning at the top:

DEVONIAN AGE.

5. Catskill period	Catskill red sandstone.
4. Chemung period	Chemung epoch.
	Portage epoch.
3. Hamilton period	Genesee epoch.
	Hamilton epoch.
	Marcellus epoch.
2. Corniferous period	Corniferous epoch,
	Schoharie epoch.
	Cauda-galli epoch.
1. Oriskany period	Oriskany red sandstone.

1. The Oriskany sandstone extends from near Oriskany, Oneida co., N. Y., s.w. along the Appalachians into Pennsylvania, Maryland, and Virginia. It appears near Buffalo, in Canada near Waterloo, in Ohio, Indiana, southern Illinois, and Missouri. Its thickness at Oriskany is about 30 ft.; in Illinois, 250 to 300 feet. Its rocks are mostly sandstone, but there are strata of limestone in the Mississippi valley, and in the region w. and n. of Moosehead lake. Its most abundant fossils are *spirifers*, with other mollusks. There are no land-plants in the New York and western beds, but lycopods occur in the upper limestones at Gaspé.

2. The Corniferous period. The cauda-galli grit, chiefly argillaceous sandstone, is 50 or 60 ft. thick in the Helderberg mountains of eastern New York. The name comes from a characteristic fossil sea-weed of feathery form. The rocks of the Schoharie epoch are fine-grained calcareous sandstones, similar in quality and distribution to the preceding, but differing in their fossils, which are very numerous. The upper Helderberg is farther divided into the Onondaga limestone and the corniferous limestone—the latter taking its name from the presence of much imperfect flint or horn-stone (*cornu*, a horn). The corniferous limestones occur in New York, in Ohio along lake Erie, and throughout the Mississippi basin from Michigan to Kentucky, and from Ohio to Missouri. Its greatest thickness, in Michigan, is 354 feet. Its notable fossil plants are lycopods, conifers, and tree-ferns. This period was the coral-reef period of palæozoic times, and corals are found in great number and variety. The falls of the Ohio, at Louisville, are caused by such an ancient reef, and are rich in coral fossils. The remains of vertebrates first appear in the corniferous epoch. They include relics of sharks, cestracient and hybodont; of ganoids, having the body covered with shining plates of mail, now represented by the gar-pike; and of placoderms, having the body covered with bony plates, such as are worn by the turtles—fishes which seem to have linked the ganoids with the sharks.

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3. The Hamilton period includes the Marcellus shales, the Hamilton beds, and the Genesee shales. This formation extends across New York, its greatest thickness, 1500 ft., being e. of the center. It occurs southwardly to Tennessee, and westwardly to Iowa and Missouri; also in the valley of the Mackenzie, so that Meek believed that Devonian rocks are continuous from Illinois to the Arctic ocean, a distance of 2,500 miles. The Hamilton beds furnish superior flagging stones; the Genesee shales produce great quantities of petroleum, and occasionally of gas that may be used for heating and lighting. The vegetable fossils are lycopods, including lepidodendroids, sigillarids, and stigmaria, ferns, equisetæ, and conifers. The animal fossils still abound in corals and brachiopods; in this period appears the goniatites, the ancestor of the modern nautilus. Among articulates we notice a new form of trilobite, and especially the earliest insect remains, in form akin to the ephemeræ. Vertebrates are represented by fishes, like those of the corniferous period. See illus., SILURIAN AND DEVONIAN FOSSILS, vol. XIII.

4. The epochs of the Chemung period are the Portage and the Chemung. The rocks of the lower, or Portage group, appear in western New York, having a thickness of 1000 ft. on the Genesee, and 1400 ft. on lake Erie. The Chemung rocks extend over the southern counties of the state, being about 1500 ft. thick near Cayuga lake. Farther s., in Pennsylvania and beyond, they become 3,000 ft. thick. Ripple-marks, mud-marks, and sun-cracked mud abound, indicating shallow seas, and lands alternately under, and out of, water. Sea-weeds and land-plants alternate.

5. The Catskill period produced shales and sandstones of various colors, chiefly red. This formation has a thickness of 2,000 to 3,000 ft. in the Catskills, and nearly 6,000 ft. in the coal regions of Pennsylvania, but thins out toward the west. It contains few fossils, and these not materially different from those of the lower periods. The Devonian age closed with an epoch of great disturbance along the eastern border. The rocks were uplifted at various angles previous to the deposition of the carboniferous strata. The rising of Maine above the sea was probably completed during this age.

DEVONIAN SYSTEM, the name proposed by Murchison and Sedgwick to replace the more characteristic and older term old red sandstone, because the slaty and calciferous strata in Devonshire contain a much more copious and rich fossil fauna than the red arenaceous rocks of Scotland, Wales, and Herefordshire, with which they were shown to be contemporaneous. The older descriptive name, old red sandstone, is still generally retained, and to it we refer for a description of the rocks of the system.

DEV'ONPORT (before 1824, called PLYMOUTH DOCK), a parliamentary and municipal borough, maritime and fortified town, and naval arsenal, in the s.w. of Devonshire, situated on Stonehouse creek, on the e. shore of the estuary of the Tamar (which is 4 m. long by half a mile broad, and called the Hamoaze), 2 m. w.n.w. of Plymouth. It stands on high ground, with ramparts defended by batteries. It is a very important military and naval station, being the seat of the military and naval government of "The Three Towns," that is, D., Stonehouse, and Plymouth. Its dockyard and naval arsenal are among the most important establishments of this kind in the United Kingdom. There are also naval and military barracks, hospitals, a gun-wharf, a steam-yard, and a powder depot. Mt. Wise is a fine parade ground, and contains the residences of the lieutenant-governor and the port-admiral. D. has important steamship communications. Pop. '91, 54,803.

DEV'ONSHIRE, a maritime county, in the s.w. peninsula of England, between the Bristol and English channels. Greatest length, 71 m.; greatest breadth, 68; average, 46; area, 2,597 sq. m., three fourths being in pasture or arable. The n. coast, 60 m. long, is mostly steep and rocky; the chief indentation being Bideford bay, 18 m. broad and 8 deep. The s. coast, 100 m. long, is also lined with cliffs, and has Tor bay, 3 by 3½ m., and Plymouth sound, 3 by 3 miles. The general surface is hilly, and the tablelands of Dartmoor in the s. of D., Exmoor in the n.e. of Devon and n.w. of Somerset, and Blackdown in the e. of D., are high, heathy, and rocky. The lower hills are grassy. The loftiest eminence is Yes Tor, in Dartmoor forest, 2,040 feet. The chief rocks are granite in Dartmoor, and Devonian, carboniferous, and Permian strata, with some Silurian strata, magnesian limestone, greensand, chalk, and trap. Copper, tin, iron, and other metals occur, with china, potters' and fire clays, Bovey coal, marble, gypsum, fluor-spar and loadstone. Of these the most important are the china, potters', and fire clays, which are mined at Cornwood, Plympton, Newton Abbot, Shaugh, Bovey Tracey, Torrington, Kingsteignton, and Bideford. Copper ore is obtained at Buckland Monachorum, Tavistock, Lamerton, and Okehampton. Tin is mined at several localities; arsenic at Tavistock and Mary Tavy, and barytes in the Teign valley. Iron ore, umber, ochre, and lignite are mined to a small extent. The rivers are very numerous, the chief being the Exe, 54 m. long.; Dart, 36; Tamar, 59: Torridge, 53; and Taw. These rivers have tidal estuaries, 5 to 11 m. long. There is an intermitting spring at Brixham. The climate is humid and equable—cool in summer, and mild in winter. The great mildness of the s. coast in winter has made it much resorted to by invalids, especially those in consumption. Here myrtles flourish in the open air, and, with a little care, the orange and lemon. From its humidity, D. is more grassy than Cornwall, and there are fine meadows along the rivers. In the s., especially in Exeter Vale, the soil is very productive.

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The chief crops are grass and clovers, alternating with corn and potatoes. The fertile red loam of Exeter Vale produces wheat, barley, beans, pease, and flax. D. has much oak-wood and extensive orchards. It is famed for clotted cream and cider. The apple-trees grow on the hill-slopes and in the hedges. The chief manufactures are serges, linen, gloves, lace, boots, etc.; the chief exports are butter, cheese, cattle, and sheep. The red Devon breed of cattle is highly valued. Dartmoor mutton and Exmoor ponies are famous. D. has important pilchard, mackerel, dory, and salmon fisheries. The electric torpedo occurs in the estuaries. The chief towns are Exeter (the county town), Plymouth, Devonport, Tavistock, Tiverton, and Barnstaple. Pop. in '91, 631,767; in '81, 604,397. D. has many British and Roman remains, as stone circles, dolmens, barrows, and camps.

DEVONSHIRE, Duke of. See **Hartington, Marquis of.**

DEW. For any assigned temperature of the atmosphere, there is a certain quantity of aqueous vapor which it is capable of holding in suspension at a given pressure. Conversely, for any assigned quantity of aqueous vapor held in suspension in the atmosphere, there is a minimum temperature at which it can remain so suspended. This minimum temperature is called the dew-point. During the daytime, especially if there has been sunshine, a good deal of aqueous vapor is taken into suspension in the atmosphere. If the temperature in the evening now falls below the dew-point, which after a hot and calm day generally takes place about sunset, the vapor which can be no longer held in suspension is deposited on the surface of the earth, sometimes to be seen visibly falling in a fine mist. This is one form of the phenomenon of dew, but there is another. The surface of the earth, and all things on it, and especially the smooth surfaces of vegetable productions, are constantly parting with their heat by radiation. If the sky is covered with clouds, the radiation sent back from the clouds nearly supplies an equivalent for the heat thus parted with; but if the sky be clear, no equivalent is supplied, and the surface of the earth and things growing on it become colder than the atmosphere. If the night also be calm, the small portion of air contiguous to any of these surfaces will become cooled below the dew-point, and its moisture deposited on the surface in the form of dew. If this chilled temperature be below 32° F., the dew becomes frozen, and is called *hoar-frost*. The above two phenomena, though both expressed in our language by the word dew, which perhaps helps to give rise to a confusion of ideas on the subject, are not necessarily expressed by the same word. For instance, in French, the first phenomenon—the falling evening-dew—is expressed by the word *serein;* while the latter—the dew seen in the morning gathered in drops by the leaves of plants, or other cool surfaces—is expressed by the word *rosée*.

The merit of the discovery of the "Theory of Dew" has been commonly ascribed to Dr. Wm. Charles Wells, who published in 1814 his *Essay on Dew*, which obtained great popularity. The merit should, however, be divided between him and several others. M. Le Roi of Montpellier, M. Pictet of Geneva, and especially Prof. Alex. Wilson of Glasgow, largely contributed by experiment and induction to its formation. Its history is very interesting, and the curious reader will be well repaid by a perusal of an article on the subject by Mr. Tomlinson of King's College School, London, in the *Edinburgh New Philosophical Journal* (new series), vol. xiii. No. 1 Jan., 1861.

DEW, Thomas Roderick, 1802–46; b. Va.; graduate of William and Mary college, professor of moral science in that institution, and president, 1836. In 1832, he published an essay on *Slavery*, which is said to have put a stop to a movement then assuming considerable proportions, to proclaim emancipation in Virginia. His most important work is a *Digest of the Laws, Customs, Manners, and Institutions of Modern Nations.*

DEWART, Edward Hartley, D.D., was born in county Cavan, Ireland, Mar. 30, 1828; was educated in Toronto, Canada, became a Methodist Episcopal minister 1851, and in 1869 editor of the *Christian Guardian*. He has published *The Development of Doctrine* (1879) and *Jesus the Messiah in Prophecy and Fulfillment.*

DEWAS', a town of Central India in the Manpur Agency, 20 m. n.n.e. from Indur. It is the capital of a petty state or raj under British protection. Population in 1891, 15,100, of whom 10,300 were Hindus, and 3700 Mohammedans.

DEW'BERRY, *Rubus cæsius*, a plant of the same genus with the bramble (q.v.), and very nearly allied to it, but having weaker and more prostrate roundish stems, which take root at the end, their prickles unequal and passing insensibly into hairs, the fruit consisting only of a few (1 to 5) grains, which, however, are much larger than those of the brambleberry. The name is derived from the dew-like, bluish bloom which covers the fruit. The D. is common in some parts of Britain, and in many parts of Europe and of Asia. The fruit is very sweet and agreeable, and makes an excellent wine. The D. of North America (*R. procumbens*), abundant in the forests of Canada, is a delicious fruit, much superior to the British fruit of the same name, and more tart. The plant is of very humble growth, scarcely rising above the ground.

DEWEES', William Potts, 1768–1841; b. Penn.; a physician. He selected obstetrics as his specialty, in which he won much reputation. He was professor of the diseases of women and children in the university of Pennsylvania. Among his publications are *System of Midwifery; Treatise on the Physical and Medical Treatment of Children; Treatise on the Diseases of Women;* and *Practice of Medicine.*

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DE WETTE, WILHELM MARTIN LEBERECHT, one of the ablest theologians of modern Germany, was b. 14th Jan., 1780, at Ulla, near Weimar, and studied at the university of Jena. In 1807, he was appointed extraordinary professor of philosophy at Heidelberg; in 1809, professor of theology; and in 1810, was called to Berlin. By his popularity as a teacher, as also by his writings, De W. soon acquired a great reputation. In 1819, on account of a letter which he wrote addressed to the mother of the assassin of Kotzebue, he was deprived of his chair. Not long after, however, he was appointed professor of theology in the university of Basel, where his prelections and sermons in a short time secured him universal esteem and applause. In 1829, the grand council of Basel made him a member of the council of education, and granted him the freedom of the city. In 1849, he was elected rector of the university, but died the same year, on the 16th of June.

De W. was a man of comprehensive learning, and acute philosophic discernment. His antipathy to the shackles of dogmatic theology gave keenness and vigor to his criticism. Yet he formed no school, and followed no master, so that it is difficult to describe his position. He cannot be classed either with Paulus, Strauss, or Baur. A temperate but very decided historical rationalism, on a broad basis of moral reverence, would perhaps best express his biblical stand-point. His principal works are: *Beiträge zur Einleitung in das Alte Testament* (Contributions to an Introduction to the Old Testament), 2 vols. (Halle, 1806–7); *Commentar über die Psalmen* (Commentary on the Psalms), Heidelberg, 1811; *Lehrbuch der historisch-kritischen Einleitung in die Bibel Alten und Neuen Testaments* (Historico-Critical Introduction to the Books of the Old and New Testament), 2 vols. (Berlin, 1817–26); *Lehrbuch der Christlichen Dogmatik* (Compendium of Christian Dogmatics), 2 vols. (Berlin, 1813–16); *Christliche Sittenlehre* (Christian Ethics); *Vorlesungen über die Religion, ihr Wesen, and ihrer Erscheinungsformen* (Lectures on Religion, its Essence, and Forms of Manifestation), Berlin, 1827; *Das Wesen des Christlichen Glaubens* (The Nature of the Christian Faith), Basel, 1846; and *Exegetisches Handbuch zum Neuen Testament* (Exegetical Handbook of the New Testament). Besides these, De W. published a critical edition of the entire works of Luther.

DEWEY, a co. in northern S. Dakota, on the Missouri river; formed in 1883 from Rusk. It is unorganized. Area, 2235 sq. m. Post office, Cheyenne Agency.

DEWEY, CHESTER, D.D., LL.D., 1784–1867; b. Mass.; a botanist, professor of natural philosophy in Williams college; in 1850 was appointed to the chair of chemistry in the university of Rochester.

DEWEY, MELVIL, was born in Adams Centre, N. Y., in 1851; graduated at Amherst College in 1874, and became in 1873 acting librarian in that institution, resigning in 1876. In 1883 he was made Librarian of Columbia College, and in 1884 Professor of Library Economy; in 1889, Secretary and Treasurer of the N. Y. State University, State Librarian, and Director of the State Library School, founded by him at Columbia College in 1884. He is the founder of the American Library Association, of the *Library Journal*, and author of the Dewey system of classifying books.

DEWEY, ORVILLE, D.D., b. Mass., 1794; graduate of Williams college, and divinity student at Andover. He preached in Boston for two years as assistant to Dr. Channing, forming a friendship which was only broken by death. In 1823, he became pastor of the Unitarian church in New Bedford, remaining there ten years. He went to New York in 1835, and while there secured the building of the "Church of the Messiah." About 1844, he quitted the pulpit and lectured in various parts of the country on "The Problem of Human Life and Destiny," and on other subjects. Among his works are *Letters on Revivals; Discourses on Human Nature; Discourses on Human Life; Discourses on the Nature of Religion; The Unitarian Belief;* etc. He d. 1882.

DEWITT, a co. in central Illinois; 405 sq.m.; pop. '90, 17,011. It has a level prairie and forest surface. Coal is the chief mineral product. Co. seat, Clinton.

DEWITT, a co. in s. Texas, on the Guadalupe river; 918 sq.m.; pop. '90, 14,807. It has a rolling and hilly surface and fertile soil. Co. seat, Cuero.

DE WITT, JAN, a celebrated statesman of Holland, b. at Dort in 1625, was the son of Jacob de Witt, a vehement opponent of William II., prince of Orange. Jan inherited his father's hatred of the office of stadtholder, and the family that filled it. His education was carefully attended to, and he soon exhibited remarkable ability. He was one of the deputies sent by the states of Holland in 1652 to Zealand, for the purpose of dissuading that province from adopting an Orange policy. There his eloquence secured him universal confidence, which, however, in such troublous times could not long be retained. In the same year he was made grand pensionary. The Orange party (supported by the populace and the clergy), during the war carried on between England and Holland, was ever striving to increase the power of the young prince (afterwards William III.), who was then a mere infant; the republican, or oligarchic party, composed of the nobles and the wealthier burgesses, at the head of which was De W., sought, on the other hand, to strip the house of Orange of all power, and to abolish entirely the office of stadtholder. During William's minority, the advantage was, of course, with De W. and the republicans. In 1654, on the conclusion of the war with England, a secret article was inserted in the treaty drawn up between De W. and Cromwell, in virtue of which the house of Orange was to be deprived of all state-offices. After the restoration

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of Charles II., De W. leaned more to the side of France. This tendency necessarily received an impetus from the renewal of hostilities between England and Holland in 1665. These lasted for two years; and although De W. acted with great vigor, his influence was diminished, and his party was compelled to concede a larger measure of power to the house of Orange. De W.'s prospects became still more clouded when the designs of Louis XIV. upon the Spanish Netherlands became manifest. The Orange party carried their point in the elevation of William to the family dignity of stadtholder. On the invasion of the Netherlands by Louis XIV. in 1672, the prince of Orange was appointed commander of the Dutch forces; and the first campaign proving unfortunate, the popular clamor against De W. greatly increased, who had previously resigned his office of grand pensionary. His brother, Cornelius, accused of conspiring against the life of the stadtholder, was imprisoned and tortured. De W. went to see him on his release. When they were coming out of prison, they were attacked by an infuriated crowd, and were both murdered Aug. 20, 1672. The states-general demanded an investigation, and the punishment of the murderers, but the stadtholder did not take the necessary steps. De W. was personally a man of upright character. His *Memoirs* (which were published during his lifetime) contain much important political information. See Portalis's *J. De W.* (trans. 1881); Geddes's *The Administration of John De W.*

DE WITT, THOMAS, D.D., 1791–1874; b. N. Y.; graduate of the theological seminary in New Brunswick, N. J., 1812, and entered the ministry of the Reformed Dutch church. He became minister of the collegiate church in New York, 1827, and remained so all his life, a pastoral service of 47 years. He was thoroughly learned, and held many important positions, among them president of the New York historical society, and of the New York tract and mission society. He was one of the few remaining of the Reformed church clergy who could preach in the Dutch language.

DEWSBURY, a manufacturing t. and parliamentary borough in the west riding of Yorkshire, situated at the base of a hill, on the left bank of the Calder, is 32 m. s.w. of York, and 8 m. s.s.w. of Leeds. It is governed by a local board of health, possesses a chamber of commerce, and is the centre of the Dewsbury union. D. is noted for its manufactures of worsted, carpets, blankets, and various kinds of heavy woolen goods. There are collieries and ironworks in the immediate neighborhood. Railways—London and Northwestern, and Lancashire and Yorkshire. Calder navigation connects the town with Hull and Liverpool. The parliamentary borough was formed in 1867, and includes Batley and Soothill. Pop. of municipal borough, '91, 29,847. It returns one member to parliament.

Near D. is situated BATLEY, the principal manufacturing town in the kingdom for low woolen and army cloths. Pop. '81, 27,574; '91, 28,719.

DEXTER (race-horse). A brown gelding, foaled in 1858. He was put upon the track and credited with a trotting record of 2.17¼. In 1867 Mr. Robert Bonner of the *New York Ledger* purchased him for $85,000, and while in his possession, the horse made the remarkable record of a mile in 2.16. Mr. Bonner kept him until at the age of 30 years the great racer died.

DEXTER, HENRY MARTYN, D.D., b. Mass., 1821; a graduate of Yale, and of Andover theological seminary; Congregational pastor in Manchester, N. H., and Boston. He was one of the editors of the *Congregational Quarterly*, and in 1867 became editor-in-chief of the *Congregationalist*, Boston. Besides *Street Thoughts, Twelve Discourses*, and various other writings, Dr. D. published *Congregationalism*, an authentic work concerning both the principles and the usages of the churches of that order. His latest issue was *History of the Congregationalism of the last Three Hundred Years, as seen in its Literature.* This work contains an invaluable bibliography of Congregationalism, with 7,250 names of publications. As a historical scholar, industrious and keen, he occupied the first place in the department which he had chosen—pressing research to its furthest practicable point, securing accuracy in numberless details, then classifying and analyzing with a critical judgment which unfolds the vital issues. He died in 1890.

DEXTER, SAMUEL, LL.D., 1761–1816, b. Boston; graduate of Harvard and a lawyer. He was in the state legislature, and in congress both as representative and senator. In 1800, he was appointed secretary of war, and the next year secretary of the treasury. He was a candidate for governor of Massachusetts, 1814, but was defeated by his republican opponent. He was the president of the first "temperance society" in his state.

DEXTER, TIMOTHY, 1743–1806; b. Mass.; a merchant who rose to great affluence; but memorable chiefly for his eccentricities. He assumed the title of lord Timothy Dexter. Having an itch for authorship he published *A Pickle for the Knowing Ones.* Being troubled by his printers about punctuation, he retaliated by writing a pamphlet without a comma or any other point, but at the end he put half a page of points in a mass, inviting his readers to "pepper the dish to suit themselves." He also organized his own funeral procession in the most elaborate and extensive manner.

DEXTRINE (syn. British gum, torrefied starch). When starch is carefully heated to 400° F. (260° C.), or until vapors arise from it, it becomes soluble in cold and hot water, and loses its gelatinous character; it also has the property, when viewed by polarized light, of turning the plane of polarization to the right; hence its name. It is often used as a

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substitute for gum-arabic in the processes of calico-printing, and for stiffening different goods; it is also applied to the back of postage-stamps. Its value as a substitute for gum consists in its being more flexible and less brittle when dry than that substance. Starch may be converted into dextrine by the long-continued action of dilute acids at a high temperature; also by the action of diastase (q.v.). Dextrine and starch are isomeric, both being composed of $C_{12}H_{20}O_{10}$; but dextrine may be distinguished from the latter body by its pale buff color, its insolubility in alcohol, and its not being rendered blue by iodine, which gives with it a dingy purple tint.

DEY, a word of doubtful origin, but appropriated by the ruler of Tripoli, and also of Algiers until its conquest by the French. At one period, Tunis likewise was governed by a dey, but this title has long been supplanted by that of bey. See BEG.

DHALAC, or DAHLAK, an island in the Red sea, off the coast of Abyssinia, in lat. 15° 46′ n., long. 40° 6′ e. It is 30 m. long, 15 m. in average breadth, and 120 m. in circumference. It is composed of coral rock, and its surface in general is flat and sandy. The groups of islands, including D., are called the Dhalac archipelago, have an area of about 420 square miles and belong to Italy. The inhabitants are good sailors and skilful fishermen and pearl fishing is carried on to a considerable extent.

DHAMEE', a hill-state of India, of about 25 sq. m., on the left bank of the Sutlej, in about lat. 31° 12′ n., and long. 77° 8′ e.; and about 12 miles w. of Simla. It is merely a collection of mountains and valleys. The general elevation probably exceeds 4,000 ft., and even the margin of the river is 2,283 ft. above the level of the sea. D. contains a small population and pays a tribute to the British government.

DHAR, a t. situated on the table-land of Malwa, in central India, stands in lat. 22° 35′ n., and long. 75° 20′ e., at an elevation of 1908 ft. above the sea. It is said to have at one time consisted of 20,000 houses, implying a pop. of about 100,000, and though very greatly decayed, it yet retains many traces of bygone magnificence—two large mosques of red stone, ten water tanks of various sizes, and a fort defended by many considerable towers. Pop. '91, 18,400. It is the capital of a protected state of the same name.

DHAR'WAR, a t. in the province of Bombay, close to the frontier of Madras, stands in lat. 15° 28′ n., and long. 75° 4′ east. It has government schools for Mahrattas and Canarese, besides schools established by the natives themselves. D. has a large trade in cotton, being connected by rail with the port of Marmagao. Pop. '91, 32,800.

DHAR'WAR, the district of which the t. before mentioned is the capital, extends in n. lat. from 14° 16′ to 15° 50′ and in e. long. from 74° 50′ to 76°, containing 4603 sq. m., and (1891) 1,051,000 inhabitants. Its drainage is divided between the Arabian sea and the bay of Bengal, passing to the latter by the Tumbudra, a feeder of the Kistnah or Krishna, and to the former by the Kali Nadi, through a deep valley of the western Ghauts. The most interesting feature of the country is its suitableness for the growth of American cotton. In 1842, after several previous failures, the New Orleans staple was cultivated with success to the extent of 25 acres; and within five years the breadth of land thus sown had increased a thousandfold. In connection with this enterprise, a good road was constructed to Coompta, on the Arabian sea, where the cotton was shipped for Bombay. Later a railway was opened from Dharwar to Marmagao. The prevalent language is Canarese, and there are a number of vernacular schools in the district.

DHOB. See CYNODON.

DHOLE, *Canis scylax*, an Indian species of dog, existing in a wild state in the western Ghauts and some other mountainous districts. It is in size between a wolf and a jackal, with rather long legs, sharp muzzle, wide and pointed ears, straight and not bushy tail, light-bay color, fierce keen eyes, and great courage. The name D. is extended to some other very similar species or varieties, natives of Ceylon, Nepaul, and other parts of the east, to which the common name *red dogs* has been sometimes applied, and for which col. Hamilton Smith has proposed the sub-generic name *chryseus*. They seem not incapable of domestication, but whether any of the domesticated dogs are derived from them is wholly uncertain. There is no reason to think that any of them are the wild offspring of once domestic races. They all want the second tubercular tooth in the lower jaw, have oblique eyes, and the soles of the feet hairy. They hunt in packs. They are all inhabitants of the deepest recesses of wild mountain-forests. A remarkable characteristic of the dholes is their hostility to the feline races, the weaker and the young of which they attack and destroy. To this is ascribed the alarm which the tiger exhibits at the sight even of a domestic dog; and "we may surmise," says col. H. Smith, "that the species of *chryseus* are the instruments nature has appointed to keep down the superabundant increase of the great *felinæ* of the wilderness."

DHOW, also DOW (Arabic). This is a vessel having a very large stern and a long beak. It is used in the Indian Ocean along the coasts of Arabia and Eastern Africa, largely by those engaged in the slave trade.

DHULEEP SINGH, THE MAHARAJAH, G. C. S. I., was born in 1838. He is the son of the famous Runjeet Singh, Rajah of the Punjaub, who died when the Maharajah was a child. The principality was then annexed by Great Britain, Dhuleep receiving an annuity of £40,000. Subsequently he was converted to Christianity, took up his

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residence in England, and in 1864 was married to a Protestant lady. In 1885, he made upon the English government a claim for various sums which were not granted. He then began to play the *rôle* of an ally of Russia, and figured for several years as an enemy of England. Finding himself out of funds, however, he made, in 1890, overtures for a reconciliation, and was pardoned. He d. in 1893.

DHUNCHEE, or **DHANCHI**, *Sesbania aculeata*, a plant of the natural order *leguminosæ*, sub-order *papilionaceæ*, of a genus having an elongated many-seeded pod, alternately swollen and contracted, as if it contained a string of beads. The D. is an annual herbaceous plant, much cultivated in Bengal upon account of its fiber; it has an erect, sparingly branched stem, 6 to 10 ft. high. It is a plant of rapid growth, and succeeds best in low and wet soils. Its fiber is coarser than hemp, unless when it is cut at a very early period of its growth, is durable in water, but contracts considerably when wetted. It is steeped and prepared very much like sunn (q.v.).

DIABE'TES (Gr. literally a syphon, from *diabainō*, I go or flow through), a disorder of the general system, of which the principal symptom is a very much increased flow of urine. Diabetes is of two distinct kinds: the one, *diabetes insipidus*, is a mere exaggeration of the water-excreting function of the kidneys, accompanied by extreme thirst, and hence called *polydipsia* (Gr. excess of thirst) by some authorities; the other is a more complex disorder of the assimilation, consequent on the formation first, and the excretion by the kidneys afterwards, of an enormous excess of animal sugar (see GRAPE-SUGAR), the sugar being found in excess, not only in the renal excretion, but in the blood, and in nearly all the secretions which have been examined. The pathology of this disease, called *diabetes mellitus* (Lat. *mel*, honey), is very obscure, notwithstanding the numerous recent physiological researches which tend to throw light on the development of sugar in the animal organism, and which must undoubtedly be regarded as bearing on the solution of the problems connected with this disease. Unhappily, the cure of it is still entirely unknown, except in so far as it may be controlled or retarded by good management of the diet, drink, and clothing. All diabetics are subject to progressive emaciation, and they often become subject to true tubercular consumption (q.v.), or other chronic disease of the lungs; it is chiefly in warding off this termination that the medical art can be of service, as well as in relieving the symptoms as they occur. The first fact observed in cases of diabetes is usually the increased flow of urine, when it becomes so great as to amount to a practical inconvenience; and also a considerable increase of the appetite, and an unquenchable thirst, which rarely fail to accompany the disease from the beginning, but often do not attract attention, or at least suggest the idea of anything wrong, till an advanced stage of the disorder. When the patient demands medical assistance, he is usually somewhat thin; the pulse is quiet, the skin cool, the heat of the surface, indeed, habitually rather low and easily depressed. There is often a complete absence of perspiration, which gives a peculiar feeling of harshness to the surface, especially of the palms of the hands. With these symptoms, the first approaches of pulmonary disease may concur. In the very last stages, there is sometimes dropsy of the feet; and the urine may be natural in quantity, or even diminished. For the other characters of diabetic urine, see URINE. The cure consists in removing from the diet, as far as possible, consistently with comfort and due nourishment, everything which easily turns to the formation of animal sugar in the system, especially all excess of farinaceous food. The complete suppression of sugar-forming food, however, as recommended long ago by Rollo, has not been found possible in practice in the majority of cases. Bread composed of gluten of wheat without starch, or bran-cakes baked with eggs, have been strongly recommended; and in most of the great capitals, as London and Paris, bakers may be found who regularly furnish bread suitable for this unfortunate class of sufferers; indeed any intelligent baker who will take the trouble, may, under medical direction, be got to manufacture such bread when required; or it may be ordered in the form of cakes and biscuits, in quantities at a time, from London houses. Dr. Camplin, himself a diabetic patient, has minutely studied the diet and regimen required, and published a little book, which we have no hesitation in recommending to all concerned, *On Diabetes, and its Successful Treatment*, in which full directions will be found for the manufacture of palatable and useful diabetic bread. The "success" alluded to, however, is simply keeping the disease at bay by constant watchfulness. Medicines proper should be used only under the advice of the physician. There is no specific, and the unguarded use of strong remedies is to be condemned. Flannel should be worn next the skin, and the languid function of the cutaneous perspiration aided by the warm bath. The Turkish bath might possibly prove useful in this disorder, and could hardly do harm if carefully employed; but we have not heard, as yet, of any actual experiments in this direction for the cure of diabetes.

DIABET'IC SU'GAR is a variety of sugar found in the blood and secretions of the higher animals, especially when afflicted with the disease called diabetes. It is a variety of grape sugar or glucose. See GLUCOSE.

DIABLERETS, a remarkable mountain of the Bernese Alps, Switzerland, situated between the cantons of Bern and Valais, in lat. about 46° 18′ n., and long. 7° 15′ e., with

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an elevation of 10,670 ft. above the sea. The D. is composed of limestone strata, the lower beds of which are so soft and shaly, that they are easily disintegrated by the infiltration of water given off from the glaciers on the n.e. The consequence is that, the foundation being worn away, the peaks tumble over into the valley, occasioning the most terrible catastrophes. Three peaks have already fallen in this way, and the two that yet remain threaten to follow sooner or later.

DIACAUSTIC. See CAUSTIC.

DIA'CHYLON (Gr. literally, from juices—i.e., vegetable juices, a deceptive etymology, as the plaster has really no such composition), the common healing or adhesive plaster, made by combining litharge, or the red oxide of lead, with olive oil, so as to form a kind of soap. The preparation of this plaster is now entirely taken out of the hands of druggists, it being prepared on the great scale by machinery.

DIACRITICAL MARKS (Gk., *diakrinein*, to distinguish). Points, or Signs, are marks which, either in printed or written matter, are added to letters or combinations of letters to give them a special pronunciation, as the *cedilla* and the *diæresis*, or to give them different phonetic values, or to show the accent, tone, or emphasis to be employed in pronunciation. The *cedilla* (Span., Fr., *cedille*, Ital., *zediglia*, from *zeta*, the Greek name for *z*) is the mark (¸) placed under the letter *c*, especially in French, whenever it is desired to give to *c* the sound of *s* before the vowels *a*, *o*, and *u*, as in *façade* and *leçon*. Formerly, the letter *z* was added after *c*, when it was to have the sound of *s*. Thus *leçon* was written *leczon*. The cedilla, therefore, has taken the place in French and Portuguese of the *z* (zeta), whence the name cedilla. *C* before *o*, *a*, when not marked with the cedilla is pronounced as *k*. The *diæresis* (Gk., a taking apart) is the sign (¨) placed over the second of two contiguous vowels to show that they are to be pronounced separately, as in *coördinate*. Often the hyphen is employed with the same effect, as in *co-ordinate*. The diæresis is usually placed over *e* after *a* or *o* to distinguish these letters from the diphthongs *æ* and *œ*. The mark is also placed sometimes over the final *ed* of a word like *praisëd*, to show that the *ed* is to be pronounced as a separate syllable. In dictionaries diacritical marks are employed to indicate the exact pronunciation of words. In Webster's Dictionary marks are employed as follows: ¯, ˘, ˆ, ˜, ˙, ·, as shown in the following series: ā, ē, ī, ō, ū, ă, ĕ, ĭ, ŏ, ŭ; câre, făr, fall, lăst, what; thêre, vẽil, tẽrm; pĭque, fĭrm; dŏne, fôr, dọ, wọlf, fo͝od, fo͝ot; fûrl, rude, pu͝sh; ç as s; çh as sh; ọ, ọh, as k; g as j; ḡ as in ḡet; s as z; x as gz; n as in linger. The explanation of these signs is given in the preface, under the title, Principles of Pronunciation. See also the preface to the "Century Dictionary," pp. 9 ff. Diacritical marks and points are regularly used as a part of the alphabetic systems of many languages. Isaac Taylor, in his work on *The Alphabet*, i., 160, says: "The Phœnician, the Punic, the Israelite, the Samaritan, and the Syriac alphabets have twenty-two letters, neither more nor less. The Hebrew and Arabic alphabets, it is true, are now able to distinguish twenty-nine consonantal sounds, but the number of characters really remains unaltered (i.e., at 22), the distinctions being effected by means of diacritical points." Again, *op. cit.*, i., 165, he says: "In Semitic alphabets additional phonetic signs have been obtained by means of the troublesome machinery of diacritical points." In Avestan also, characters are modified and multified by means of diacritical points. In transliterating foreign alphabets and representing them by English characters, the use of diacritical marks is common. For example, in transliterating Sanskrit, n̄ is used to represent the guttural n, ṇ represents the lingual, and ñ the palatal n. Similarly, ṭ, ṭh, ḍ, ḍh, represent lingual sounds. Usually in printed matter a *short* vowel is unmarked. Marks of accent, as (´), the acute, (`), the grave, and (˜) or (ˆ), the circumflex, are also to be included under the head of diacritical marks.

DIADEL'PHIA, the 17th class of the Linnæan system, comprising plants of which the filaments are united in two sets of brotherhoods.

DI'ADEM was the name given to the fillet of silk, woolen, or linen which served as the distinguishing ornament of kings. It was generally narrow, being only a little broader on the forehead. The diadem of the Egyptian goddesses and kings bore the symbol of the sacred serpent. The diadem of Bacchus, as it appears in ancient sculptures, was a plaited band going round the forehead and temples, and tied behind, with the ends hanging down. Among the Persians, the D. was bound round the tiara or turban, and was of a blue color, worked with white. The early Roman emperors refrained from using this ornament, in order not to call up recollections of the hated kingly office. Diocletian was the first to introduce it again.

DIÆ'RESIS. See DIACRITICAL MARKS.

DIAGNO'SIS (Gr. *dia*, through, and *gnosis*, knowledge), the through-knowledge or thorough knowledge of a disease, embracing its points of distinction from other diseases, its symptoms, their relation to one another, and to the state of the different organs and functions of the body, in so far as this can be appreciated during life. D. is usually spoken of in contrast with prognosis, which implies the judgment framed by the physician as to the issues of disease; and also with prophylaxis (*pro*, from, and *phylaxis*, protection), which refers to the warding off disease, when supposed to be impending. D. includes the study of all the vital phenomena of diseases, and also of their appearances after death, in so far as this can aid their discovery during the life of the patient. It is

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usual to speak of rational or physiological D., or D. by symptoms—i.e., functional changes; and of physical D., or D. by signs—i.e., objective phenomena appreciable by the senses of the observer. The latter method of D. has been much enlarged in scope, and increased in importance of late years by the modern discoveries in auscultation (q.v.) and percussion (q.v.), and also by the great advances made in physiological chemistry, and by the use of the microscope.

DIAGOM'ETER, a kind of electroscope, in which a dry pile is employed to measure the amount of electricity transmitted by different bodies, or determine their conducting power. Used to detect foreign mixture in olive oil.

DIAG'ONAL, in plane geometry, is a straight line joining any two angles not adjacent, of a rectilineal figure. A line drawn between two adjacent angles would coincide with the boundary-line. A triangle has no diagonal, because any two of its angles are adjacent; a four-sided figure has two diagonals; a five-sided, five; a six-sided, nine; etc. The number of possible diagonals in any figure is found by taking three from the number of sides, multiplying the remainder by the number of sides, and taking half the product. Thus, in the six-sided figure, the process is $\frac{3 \times 6}{2} = 9$. If the diagonals must be so drawn as not to intersect, their number is always three less than the number of sides. It makes no difference whether they all proceed from one angle or not. A diagonal in a solid bounded by planes, is a line joining any two solid angles so situated that the line does not coincide with any line on the surface. To find the number of such diagonals in a given solid: Multiply the number of solid angles by the same number diminished by one, and from half this product subtract the number of edges on the figure, and also the sum of the number of diagonals in all the faces. Thus, the cube gives $\frac{8 \times 7}{2} - 12 - 6 \times 2 = 4$ diagonals.

DIAGONAL SCALE, a system of lines by means of which hundredths of units may be laid down or measured with compasses. When the numbers representing the lengths of the sides of any figure would give lines of an inconvenient size taken from the scale, the numbers may be all multiplied or all divided by such a number as will adapt the lengths of the lines to the required dimensions of the figure.

DIAGORAS, a Greek poet and philosopher, was b. in Melos, an island of the Cyclades. He flourished in the 5th c. B.C., but beyond his reputation for atheism, nothing very positive is known regarding his career. He is said to have been a disciple of Democritus of Abdera, and to have resided during the more important part of his life in Athens. He is alluded to by Aristophanes in the *Clouds* (424 B.C.); and from an epithet applied there to Socrates, it is highly probable that that great philosopher had been a pupil of D., or at least held similar opinions. This will perhaps explain to us the accusation brought against him of atheism. In all likelihood, D. was no atheist, but simply a *disbeliever in polytheism;* and the anecdotes related of him, such as his once throwing, when ill-off for fuel, a wooden image of Hercules into the fire, to cook his dinner, serve to confirm such a supposition. He seems to have been witty and fearless, and probably treated the rude superstitions of the common-place Athenians with dashing contempt. In this way he may have become specially notorious, and so fixed himself in the Greek mind as the *representative* atheist. D. was banished from Athens professedly on account of his impiety, but really on account of his politics. He went first to Pallene, and afterwards to Corinth, where he died. He wrote lyrics of various kinds, and a philosophical work entitled *Phrygion Logoi.* Personally, he was a man of untainted character, and discharged his duties as a citizen in an earnest and exemplary manner.

DIAGRAM, a figure so drawn that its geometrical relations may illustrate the relations between other quantities. The area of a rectangle is the product of its length and breadth; the diagram of the rectangle becomes the visible symbol, corresponding to the equation $a = bl$; by analogy, the rectangle may be used to symbolize any quantity which is the product of two factors. Similarly, a parallelopiped may symbolize any quantity which is the product of 3 factors; e.g., interest, which is the product of principal, rate, and time, i = p.t.r., may be symbolized by a diagram in which principal is figured by length, time by breadth, and rate by height, the total volume representing the interest.

The purpose of ordinary mathematical diagrams is simply illustration, and it is therefore necessary only that the ideas be clearly presented, accuracy of drawing being unimportant. Other diagrams, as some drawn by engineers and architects, are intended to furnish magnitudes or distances by actual measurement, and their execution cannot be too careful. Other diagrams, like those showing electric connections, require only a proper showing of the parts and the methods of uniting them. A profile diagram shows such an outline as would be formed, for example, if a hill were cut through by a vertical plane, and the material on one side of the plane were removed. Evidently a succession of such profiles might be laid upon the same sheet of paper, the lines being distinctively drawn, and the whole would serve to compare several vertical profiles of the same mass. It is not necessary that vertical and horizontal measurements should con-

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form to the same scale, provided that each series of measurements is consistent with itself. Geographical profiles, which include upon a single sheet the outlines of entire continents or ocean-beds, have usually the vertical measurements on a scale several times greater than that used for horizontal distances; otherwise the diagram would be made inconveniently long, or the heights would be inconspicuously small. Yet the impression left by such a diagram is often mischievous, especially upon the illiterate. A topographer's contour map exhibits a series of curves, such as would be formed if a series of horizontal sections were made, and the outlines carefully laid down upon paper. The drawing may be understood to show the horizontal projections of the contour lines upon a surface parallel to the system. In the representations of parts of machinery, particularly those designed to guide workmen in construction, several connected views of the same object are required, each view giving some information which the others cannot furnish. Suppose three planes perpendicular to each other, like the bottom, one side, and one end of a rectangular box, and let an object, as a hexagonal nut, be placed within the triedral angle thus formed. Looking from the front, we see one image of the nut projected against the back of the box; from the side, a different image is seen against the end of the box; from above, a third form appears against the bottom of the box; while from one or other of these figures all the measurements of the nut may be obtained. If now the end of the box were swung outward into the plane of the back of the box, and then both together were laid back into the plane of the bottom, we should have the three co-existent drawings in one plane, and they may be transferred to, or be constructed on, one sheet of paper. In many cases the same points will find representation upon each of the three diagrams, and the fact may be indicated by using the same letter for a point wherever it occurs; while the eye may be led from one position of it to another by lines, conventionally drawn, as fine, or dotted, or broken, to show that they are merely guides and not parts of the diagram.

Many devices have been invented by which diagrams illustrating natural phenomena may be automatically described. Let us suppose that a spring dynamometer is placed where it may receive the draft of a horse when moving a carriage. Let the movement of the spring be shown by an index whose motion is back and forth along a line in the direction of the draft. Fix a pencil to the index, and let its point rest upon a sheet of paper on a plane or a cylinder which moves at a uniform velocity in a direction perpendicular to the motion of the index. The combined movements of the pencil and the paper beneath it will trace a line more or less irregular. If the force of draft were unvaried, the pencil would remain at a constant distance from the edge of the paper, and the trace would be parallel to the edge. If the paper does not move and the pencil varies, the line will be perpendicular to the edge. If both move, and the pencil be obedient to a diminishing force, the trace will be oblique, approaching one edge; while if the force increase, the oblique trace will diverge from the same edge. Such mechanism is often arranged for instruments which indicate meteorological changes, as the force and direction of winds; or the pulsation of the arteries, as in the sphygmograph; or the movements of a clock, combined with the observations of an astronomer, as in the chronograph; applicable also to many physical problems. An application of the same principle has great importance in the indicator diagram, by which the pressure of the steam in the steam-engine and the work done by each stroke of the piston, becomes a matter of record for investigation. The paper moves with the movement of the piston, both in its excursion and return; the pencil moves at right angles to the direction of the motion of the paper, under the influence of the steam-pressure; and the diagram drawn shows for each instant of the stroke the volume and pressure of the steam, while the total area of the diagram indicates the amount of work done.

DIAL, The, a magazine founded, 1840, in Boston, to represent what was then known as the "transcendental" school of thought in philosophy and religion. It was continued only 4 years, first under the editorship of Margaret Fuller, assisted by George Ripley and Ralph Waldo Emerson; afterwards under Ripley's editorship. It was distinguished for the boldness and ability with which it announced and defended theories of men and society then quite novel. Many able writers contributed to its pages.

DI'AL AND DIALING. A *sun-dial* is an instrument for measuring time by means of the motion of the sun's shadow cast by a stile erected on its surface. It is an instrument of very great antiquity, the earliest mention of it being in Isaiah xxxviii. 8; and before clocks and watches became common, it was in general use as a time-keeper. The art of constructing dials to suit any place and situation, was then an important branch of mathematical study; now the subject is more an object of curiosity than utility.

A dial consists of two parts—the *stile* or gnomon, usually the edge of a plate of metal, always made parallel to the earth's axis, and pointing towards the north pole; and the *dial-plane*, which may be of any hard substance, and on which are marked the directions of the shadow for the several hours of the day, their halves, quarters, etc. Dials receive various names, according, mostly, to the positions which they are constructed to occupy. When the dial-plane is on the plane of the horizon, the dial is called a horizontal dial; when perpendicular to that plane, a vertical dial. An equinoctial dial is one whose plane is parallel to the equinoctial plane. Besides these names,

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there are others, such as the s. dial, n. dial, e. dial, w. dial, polar dial, declining dial, of which it is useless to write at length. These names all depend on the position of the dial-plane. The cylindrical dial is a dial drawn on the curved surface of a cylinder. The ring dial is an ingenious small portable dial, but rather a curious toy than a philosophical instrument.

A *night* or *nocturnal dial* is an instrument for showing the hour of the night by the shadow of the moon or stars. Moon-dials may be constructed relative to the moon's motion; or the hour may be found by the moon's shadow on a sun-dial by the following rule: Observe the hour pointed out by the moon's shadow; find the days of the moon's age in the calendar, and take three fourths of that number for the hours to be added to the time shown by the shadow to give the hour of the night.

Dialing.—The *stile* of a dial being parallel to the earth's axis, those familiar with spherical trigonometry will readily see that the problem of constructing a dial resolves itself into that of ascertaining where the hour-lines cut a given circle, with a view to the graduation of the dial-plane. We do not here presume the reader to be acquainted with spherical trigonometry, and accordingly proceed to illustrate the principles of dialing in a popular manner, taking our illustrations from Ferguson's *Lectures* (4th ed., 1772, lecture 10), which should be referred to for fuller information. Suppose a hollow and transparent sphere, as of glass, to represent the earth; and suppose its equator divided into 24 equal parts by the meridians, one of them passing through a given place, say London (see HORIZON). If the hour of twelve be marked at the equator, both on the latter meridian and that opposite it, and all the rest of the hours in order on the other meridians, those meridians will be the hour-circles of London, because, as the sun appears to move round the earth in 24 hours, he will pass from one meridian to another in one hour. Then, if the sphere has an opaque axis, terminating in the poles, the shadow of this axis would fall, in the course of the day, on every particular meridian and hour, as the sun came to the plane of the opposite meridian, and would thus show the time at London, and at all other places on the same meridian as London. If the sphere were cut through the middle by a plane in the rational horizon of London, and if straight lines were drawn from the center of the plane to the points where its circumference is cut by the hour-circles of the sphere, those lines would be the hour-lines of a horizontal dial for London; for the shadow of the axis would fall upon each particular hour-line of the dial, when it fell upon the like hour-circle of the sphere. Similarly, if we suppose the sphere cut by *any* other plane facing the meridian, the hour-circles of the sphere will cut the edge of the plane in those points to which the hour-lines must be drawn straight from the center; and the axis of the sphere will cast a shadow on these lines at the respective hours. The like will hold of any plane, whether it face the meridian or not, provided it do not coincide with it, or do not coincide with a plane through the poles, and perpendicular to the plane of the equator. In the latter case, the axis would have no elevation above the plane of the dial; in the former, the shadow would not move circularly.

The *universal dialling cylinder*, an invention of Ferguson's, is a glass cylindrical tube, closed at both ends with brass plates, on the centers of which a wire axis is fixed. The tube is either fixed to a horizontal board at an angle equal to the latitude of the place, or moves on a joint, so that it may be elevated till its axis is parallel to the earth's at any latitude. The 24 hour-lines are drawn on the outside of the glass, equidistant from one another, and parallel to the axis. The XII on the upper side of the cylinder stands for midnight; the XII next the board, for noon. When the axis is adjusted for the latitude, and the board leveled, with both XII, noon and midnight, in the plane of the meridian, and the end towards the n., the axis, when the sun shines, will serve as stile, and cast a shadow on the hour of the day among the parallel hour-lines. As the plate at the upper extremity of the cylinder is perpendicular to its axis and parallel to the equator, right lines drawn from the center to the extremities of the parallels will be the hour-lines of an equinoctial dial, and the axis will be the stile. A horizontal plate, if put into the tube, with lines drawn from the center to the several parallels cutting its edge, will be a horizontal dial for the given latitude; and similarly a vertical plate fronting the meridian, and touching the tube with its edge, with lines drawn from its center to the parallels, will be a vertical s. dial, the axis of the instrument in both cases serving for the stile; and similarly for any other plate placed in the cylinder. If, instead of being of glass, the cylinder were of wood, any of these dials might be obtained from it by simply cutting it in the planes of the plates, and drawing the lines on the surface of the section.

DI'ALECT. In speaking of a people having essentially all one language, but living extended over an extensive territory, the name of dialects is given to those varieties or peculiar forms which that language assumes among the various tribes or other local divisions of the people. It is clear that the wider the separation comes to be between the several tribes, and the more they differ in mode of life and other circumstances, the more marked will the differences of D. become. Also, when a particular tribe of this people increases in numbers, and also extends its territory, the same process is repeated, and its D. becomes broken into a number of sub-dialects. The principal check to this tendency to seemingly endless subdivision of language, is furnished by an increasing

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degree of common culture and civilization. Where this is wanting, as in Africa and among the native populations of America, the subdivision is practically endless.

Another element is introduced into the problem by the fact, that the civilization of some tribes develops itself more richly and ripens earlier than that of others, while some even undergo decline; this must occasion corresponding differences of dialect. Further, one dialect may become dominant over one or more of the others, through various influences, the chief of which is the power of poetry, especially if favored by external relations. Finally, if to superior manifestations of oratory and poetry in any dialect, the conservative aid of writing be added, there is created a written language, which passes current among other tribes to the same extent that the literature of which it is the vehicle finds favor. It is not always the dialect most perfect in itself, nor yet that of the most powerful tribe or division of a people, that comes to be the written language. Accidental circumstances have, in many cases, decided the rivalry. The Bible happened to be translated by a high German, Luther, into his native dialect; other works on the then all-engrossing subject of religion followed in the same dialect; happily, too, the art of printing had just attained the perfection necessary to give these productions general circulation. It was this concurrence of circumstances that decided that high German should in future be the spiritual bond among the wide-spread German people. For there were other dialects whose claims to the distinction were at that time equal, if not higher. See also ENGLISH LANGUAGE.

When a dialect has thus become the vehicle of written communication, and of the higher kinds of oral address, its character and position become changed; and it stands henceforth in a sort of antagonism to the other dialects, and even to that out of which itself sprung. For written language is chiefly employed in the higher departments of human thought and activity. The intellectual and moral elements, therefore, predominate in it over the sensible; and what it gains in dignity, precision, and pliancy, it loses in richness of inflection, in friendly familiarity and naturalness. In conflict with this standard speech, the dialects must go to the wall. They live for a considerable time, it is true, even in the mouth of the educated classes, becoming, however, gradually more and more confined to the most necessary and familiar forms of intercouse, and losing their characteristics in the stream of the written language. They thus become, after a time, the exclusive possession of the lowr orders, in which position they preserve many relics of old grammatical forms long after these have disappeared in the language of literature, but without the power of advancing or of being enriched by the products of deep thinking; and though they may abound in single expressions of great beauty and delicacy, the general character comes to be low and coarse. But so long as a language lives, the literary standard and the dialects never cease to act and react on one another.

The chief points of difference between the dialects of a language and the standard fall under four heads. The first consists of differences in the elementary sounds or letters, each dialect having a tendency to substitute some one or more vowels or consonants for others. Thus, the standard English *bold*, is in Ireland *bowld;* in Scotland, *bauld; what*, where the *h* is nearly evanescent, becomes, in a Scotsman's mouth, or rather throat, *chwat*, and in Aberdeenshire Scotch, *fat—f* in this sub-dialect being regularly substituted for *wh*, or rather *hw*. 2. Each dialect has peculiarities of grammar: In many parts of England and in Scotland, the plural of *eye* is not *eyes*, but *eyen*, or *een*, like *oxen*. The habitual use of *be* where the standard grammar prescribes *am, is, are*, etc., is prevalent in large districts of England. Of this kind is the use of the strong conjugation for the weak, or *vice versâ*; as *loup, lap, luppen*, for *leap, leaped, leaped*. 3. Peculiarities of vocabulary: These individual words current in one or more districts, but unknown to the standard vocabulary, are properly *provincialisms*. They are generally genuine words of an older stage of the language, that have survived longer in some localities than in others. Some provincialisms, as *bearn* or *bairn*, for child, *marrow* for fellow or match, to *greet* for to weep, are common to Scotland and the n. of England. Others are more local, as to *cleam*, for to fasten or cement; *heppen*, a Yorkshire term for pretty near; *thrippa*, in Cheshire, to cudgel. The exclusion of such words from the standard language is often accidental, and many of them might be and are with advantage resumed; ex., *marrow, gloaming*, etc. 4. Peculiarities of intonation: This is sometimes, though with little propriety, called accent, which means strictly the stress laid upon a particular syllable of a word. There are no doubt local peculiarities of this kind too. The tendency of standard English, especially the more recent, is to throw the accent toward the beginning of the word; in Scotland, the tendency lingers to say *entry'* for *en'try*. But peculiarities of intonation lie in the different ways in which the *pitch* of the voice is managed—in the musical accompaniment of articulation. Differences in this respect give rise to the monotonous drawl of one district, the angry querulous tone of another, the sing-song of a third, etc.

So long as dialectic varieties of language were looked upon indiscriminately as corruptions and barbarities, they were only noticed by scholars that they might be avoided. A more rational philology, without trenching upon the rules of good writing, considers them as essential parts of the speech of a people, and a knowledge of them as necessary to any thorough investigation of the genius of that speech.

It is obvious that *dialect* is entirely a *relative* term, and that what we call by that

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name in one connection, we may call a language in another connection. Thus, Greek and Latin may be called sister-dialects of that primitive language from which it is held that they, as well as the other members of the Indo-European family, branched off. See ARYAN LANGUAGES. Speaking of Greek by itself, however, it is a language, and Ionic, Doric, Attic, etc., are dialects of it. The same holds good with the others. In practice, however nearly related the speech of two peoples may be, we do not apply the term dialects, unless the peoples are mutually intelligible and have a common literary standard. Intelligibility does not go for much, but political relations enter more or less into the notion. Thus, Scotch is sometimes spoken of as a distinct language from English: and yet in no part of Scotland is the common speech so unintelligible to an Englishman as is that of Somerset, which is always a "dialect." This arises from Scotland being thought of as a separate country, which it once was; and its speech as the vehicle of a peculiar literature. See AMERICANISMS.

DIALEC'TIC is a Greek word which signified originally "the art of conversation," but came to have a technical signification in the language of philosophy. At first, it implied a regular and scientific method of treating general conceptions or general terms —a sort of anatomy of names, and through them of the things denoted. In the Socratic philosophy, and more especially in that of Plato, dialectic was thus the method of the highest and deepest kind of speculation. Aristotle gave another signification to the word. According to him, a scientific proof or deduction is different from a dialectic proof, which is only a probable deduction. After this, dialectic came round to imply a sort of word-fence, the art of so using the forms of reasoning as to confound your opponent, and make fallacies pass for truth. Dialectic is sometimes used as synonymous with logic. Logic, however, which originated with Aristotle, is properly the science of the forms of thinking; it is less directly concerned with words than dialectic, which in this view becomes a subordinate province of logic—the art of disputation. Dialectic, in fact, is little heard of where philosophy is positive and experimental; it is chiefly used with regard to the more ideal and *à priori* speculations of such philosophers as Kant, Hegel, Schelling, etc.

DI'ALLAGE, or SCHILLER-SPAR, a mineral nearly allied to augite (q.v.), and by some regarded as a variety of it. Its chemical composition is essentially the same. It is seldom found very perfectly crystallized, but usually massive, granular, or disseminated. It has generally a metallic and pearly or silky luster. A very beautiful bright green D. (smaragdite), found in Switzerland, Italy, Corsica, India, Labrador, etc., is prized for ornamental purposes; in Corsica, it occurs disseminated in a feldspar (*Labradorite* or *Saussurite*), which, when cut and polished, appears spotted with it, and is of great beauty, is made into boxes, vases, etc., is much valued, and is known by the names *gabbro* and *verde di Corsica duro*. A variety of D., usually yellowish or brownish, is sometimes called *bronzite*.

DI'ALOGUE, a conversation between two or more persons, implying, however, greater unity of subject and formality than an ordinary conversation. The ancient Greek philosophers were fond of this way of conducting their investigations and conveying their instructions. The Socratic dialogue is a conversation in the form of question and answer, so contrived that the person questioned is led himself to originate those ideas that the questioner wishes to bring before him. The dialogues of Plato are, as it were, philosophical dramas, in which the Socratic method of investigation is brought to bear upon speculative subjects. The form of the dialogue is but ill adapted to the modern state of science. Of the more eminent modern writers in this form, we may mention Erasmus in Latin; Lessing, Herder, and Wieland among the Germans; Petrarch and Machiavelli in Italy; Fénelon and Fontenelle in France; and Berkeley, Hurd, and Harris in England. Landor's *Imaginary Conversations* are a happy effort of this kind. When dialogue is combined with action, we have the drama.

DIAL'YSIS. See OSMOSE.

DIAMAGNETISM. The fact that iron is attracted by the magnet, has been known from very remote times; that bismuth exhibits a repulsive action towards the magnetic needle, has been now known for nearly 100 years. Dr. Faraday was the first (1845) to show that all bodies are more or less affected by magnetic influence, and his beautiful researches on the subject have opened up a new field in the domain of science. He found that the magnetism of bodies was manifested in two ways—either in being attracted by the magnet, as iron; or in being repelled, like bismuth. When a needle or slender rod of iron is suspended between the poles of a magnet being attracted by them, it takes up a position of rest on the line joining the two poles. When a substance behaves itself in this manner, it is said by Faraday to be *paramagnetic*, and to place itself *axially*. A rod of bismuth, on the other hand, being repelled by the poles of the magnet, comes to rest at right angles. Bismuth, and the like substances, he calls *diamagnetic*, and they are said to place themselves *equatorially*. These terms, being both definite and graphic, have been universally adopted. Magnetic is the term used by Faraday to indicate magnetism of either sort, although in general language it is understood to refer to paramagnetic bodies, such as iron, etc. Paramagnetic bodies,

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then, are those which manifest the same properties with regard to the magnet that iron does; and diamagnetic bodies are those which, like bismuth, show opposite but corresponding properties; so that in circumstances where paramagnetic bodies place themselves axially, diamagnetic bodies place themselves equatorially; and where the former are attracted, the latter are repelled, and *vice versâ*. A paramagnetic, therefore, not in the elongated form, but in a compact shape, such as a ball or cube, is attracted by either pole of the magnet, when suspended near it; a ball or cube of a diamagnetic, on the other hand, experiences, when so placed, repulsion. The paramagnetism of iron, nickel, and cobalt, becomes manifest in the presence of magnets of ordinary power; but the magnetism of most other substances is so feeble as to be developed only under the influence of the strongest magnets. As electro-magnets far exceed permanent steel magnets in strength, they are selected for investigations on the magnetism of bodies. The soft iron horseshoe of the electro-magnet is enveloped towards its extremities in coils of insulated copper wire which communicate with a galvanic battery by wires. The electro-magnet is fixed in an upright wooden frame. The ends or poles of the magnet rise slightly above the table or board which forms the upper part of the frame. In order conveniently to suspend substances between the poles, and to protect them while under observation from currents of air, a glass frame of simple construction is made to fit the table. The upper plate of the frame admits a wooden ring, into which an upright glass tube is fitted. The thread by which the needle is suspended is wound round a slender movable bobbin at the top, so that it can be elevated or lowered to the proper position. To modify and direct the action of the magnet, two pieces of soft iron are made to rest on the end faces; these are pointed at one extremity, and flat at the other, so that the force of the magnet may be concentrated in the points, when they are turned towards each other; or diffused over the opposite flat surface, when their position is reversed.

To observe the effect of the magnet on liquids, Faraday placed them in long tubes of very thin glass, and suspended them as in the case of solid needles. It was found that some arranged themselves axially, and others equatorially. The attraction and repulsion that liquids experience in the presence of the magnet has been prettily shown by Plucker. A large drop of liquid is placed in a watch-glass, and laid upon two poles of the magnet. If the liquid be paramagnetic, the surface becomes depressed at the interval between the poles, and heaped up over the extreme edges of them. A diamagnetic liquid, on the other hand, shows a depression at each edge of the poles, and a heaping up at the center.

The magnetic nature of flames and gases has been also studied. When the flame of a candle is brought between the poles of a magnet, it is repelled by them, and thrown out horizontally into an equatorial position. To ascertain the magnetism of gases, Faraday inflated soap-bubbles with them, and their para- or dia-magnetism was exhibited by their being attracted or repelled by the poles. He ascertained the same by causing the gases to flow out from glass tubes in the presence of the poles, when the peculiar magnetism of the gas was shown by its choosing an axial or equatorial means of egress.

The following list gives the kind of magnetism displayed by the more common substances:

Paramagnetic.—Iron, nickel, cobalt, manganese, chromium, titanium, palladium, paper, sealing-wax, peroxide of lead, plumbago, red-lead, sulphate of zinc, shellac, vermilion, charcoal, proto and per salts of iron, salts of manganese, oxygen, air.

Diamagnetic.—Bismuth, antimony, zinc, tin, cadmium, sodium, mercury, lead, silver, copper, gold, arsenic, uranium, tungsten, rock-crystal, mineral acids, alum, glass, litharge, niter, phosphorus, sulphur, resin, water, alcohol, ether, sugar, starch, wood, bread, leather, caoutchouc, hydrogen, carbonic acid, coal-gas, nitrogen.

The nature of the medium in which the body under examination moves, exerts a powerful influence on the nature and amount of the magnetism it exhibits; thus, if a glass tube be filled with a solution of the proto-sulphate of iron, and suspended between the poles, it will place itself axially. It will do the same if made to move in water, or a solution more dilute of the proto-sulphate of iron. It will be indifferent in a solution of the same strength; but it will place itself equatorially in a stronger solution. Thus, the same substance may appear paramagnetic, indifferent, or diamagnetic, according to the nature of the medium in which it moves. As a general rule, a body shows itself paramagnetic towards one less paramagnetic than itself, indifferent towards one equally magnetic, and diamagnetic towards one more paramagnetic than itself. The same takes place, *mutatis mutandis*, with diamagnetic substances. This has given rise to the theory, that there is no such thing as diamagnetism *per se*, and that bodies are diamagnetic only in media of greater paramagnetic power than their own. This view of the case is, however, rendered highly improbable from the fact, that diamagnetism is exhibited as decidedly in a vacuum as in any medium, and a vacuum cannot be supposed to possess magnetic properties of any kind. (See Jenkins's *Electricity and Magnetism*, N.Y., 1883.)

DIAMANTINO, a town in the province of Minas Geraes, Brazil, so called from its possession of diamond mines, which for a long period were very productive. The town is on the slopes of the Serra do Espinhaco, 335 miles n. by w. of Rio de Janeiro. The sur-

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rounding country is well watered and the town is the chief trading centre of the district, but the opening up of the diamond fields in South Africa caused a decline in the production from its diamond mines. Its population has been variously estimated at from 10,000 to 15,000.

DIAMETER, in geometry, is generally used in speaking of curves, and its most general definition is, a straight line bisecting all parallel chords in a curve. In the circle, ellipse, and hyperbola, all diameters pass through the center, and are there bisected. Only the circle has all diameters equal; and each bisects the chords at right angles to it. In the ellipse, this last is only the case with the two diameters called the major and minor axes. In the parabola, all diameters are parallel to the axis. Many curves of the higher orders have no diameter at all.

We speak also of the diameters of solid bodies of a round shape. In the sphere, lines passing through the center are diameters, and so in the ellipsoid; they are all bisected in the center.

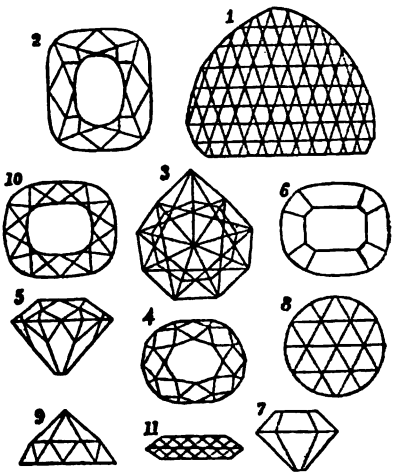
DI'AMOND (corrupted from Gr. *adamant*, untamable, refractory), the most valuable of precious stones after the ruby, and the hardest of all known substances. It consists of carbon (q.v.), a simple or elementary substance, crystallized, and in its greatest purity. Diamonds are commonly colorless and clear like water; although sometimes, from some slight foreign intermixture, they are white, gray, yellow, green, brown, and more rarely orange, red, blue, or black. The luster is adamantine and very high; the transparency perfect in specimens perfectly free from foreign substances, the presence of which, however, even in very small quantity, mars it, and sometimes almost produces opacity. The D. becomes positively electric by friction, but is not electrified by heat, a test which sometimes serves to distinguish it from the topaz. Its specific gravity is about 3.6. Its primary form is a regular octahedron, but it appears also in rhombic dodecahedrons; and its crystals often have curvilinear faces and edges. Its structure is distinctly lamellar. It burns before the blow-pipe in air or in oxygen gas, combining with oxygen to form carbonic acid. Its hardness renders it incapable of being scratched by any other substance, and in cutting and polishing diamonds, diamond-dust is employed. The estimation in which it is held as a precious stone is due to its remarkable hardness, rarity, and brilliancy. The art of cutting diamonds, although long practiced in India and China, was not known in Europe till after the middle of the 15th c., when it was discovered by Louis van Berguen of Bruges. Previous to that time, diamonds were set without being cut, and in that state they have often a rough, dull, and uneven surface. Diamonds are indeed found not only in the form of perfect crystals, but also in rolled grains; and they are obtained partly from alluvial soils and the sands of rivers, and partly from rocks, chiefly a quartzy sandstone or conglomerate, in which they are often associated with gold. A number of localities in India have long been celebrated as productive of diamonds, particularly Golconda (q.v.); they are found also in Malacca, Borneo, and other parts of the east; nor were any diamonds procured in any other part of the world till the beginning of the 18th c., when they were discovered in remarkable abundance in the district of Serra do Frio, in the province of Minas Geraes, in Brazil. Previous to that time, diamonds found in Brazilian gold mines had been disregarded as mere pebbles; their nature became known in consequence of some of them accidentally finding their way to Europe. In 1829, they were discovered in the Ural mountains. They have also been found in Rutherford co., North Carolina; in Hale co., Georgia; in the province of Constantine, Algeria; in Australia; and in South Africa. The last have proved the most productive mines in the world. Diamond mines consist in general of mere diggings and washings of alluvial deposits. In Brazil, the method pursued is to rake the alluvial matter backwards and forwards on inclined planes, over which a stream of water is made to run, till the lighter particles are carried away, when large stones are picked out by hand, and what remains is carefully examined for diamonds. The work is carried on by slaves, and when a diamond of 17 carats is found, the slave who finds it is entitled to his liberty. As diamonds consist of pure carbon many attempts have been made to reproduce them by chemical and other means artificially. This has recently been accomplished by Henri Moissau in France, who has succeeded by means of the electric smelting furnace in manufacturing very small but undoubtedly genuine diamonds. Prof. Crookes has also succeeded in making small diamonds by the same method. Pure prepared carbon is raised to a very high temperature in the electric furnace and is surrounded by a mass of molten iron which on cooling subjects the carbon to very high pressure. On dissolving the iron, small diamonds are found to be formed. Minute fragments or splinters of bort, or small inferior diamonds, are also used for making fine drills, which are used for drilling small holes in rubies and other hard stones to be employed in watch-making, gold and silver wire-drawing, etc., and for piercing holes for rivets in china, in artificial enamel teeth, etc. The use of small diamonds by glaziers for cutting glass is well known. The diamonds so used are uncut, and they are so mounted as to act upon the glass not by an angle, but by a curvilinear edge of the crystal.

Diamonds are cut into various forms, but principally into *brilliants* and *rose diamonds*. The *brilliant* cut is the most expensive and difficult, but is also that which best brings out the beauty of the stone. It has an upper or principal octagonal face, surrounded

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with many facets, and other things being equal, the greater the number of facets, the more valuable is the diamond. The lapidaries of the east, however, sometimes multiply facets to hide imperfections of the stone. *Rose diamonds* have a flat base, above which are two rows of triangular facets, the six uppermost uniting in a point. Rose diamonds are made of those stones which are too broad in proportion to their depth to be cut as brilliants. Stones still thinner are cut as *table-diamonds*. The art of sawing diamonds, when too thick in proportion to their surface, was invented by a Dutchman named Dalbeck in the beginning of the 19th century.

The value of diamonds is variously estimated. The rule generally given is to square the number of carats the diamond weighs, and then to multiply by the price of a single carat. Thus, a rough diamond of 12 carats weight, one carat being estimated at £2, would cost $12 \times 12 \times 2 = £288$. The value of a diamond is much increased by its being cut, although the actual weight is diminished. Beyond a certain weight, no rule of calculation can be applied, owing to the limited number of purchasers, and the most fabulous values have been assigned to famous diamonds. The price of diamonds varies according to the supply and changes in fashion, and is now lower than formerly.



Diamonds.

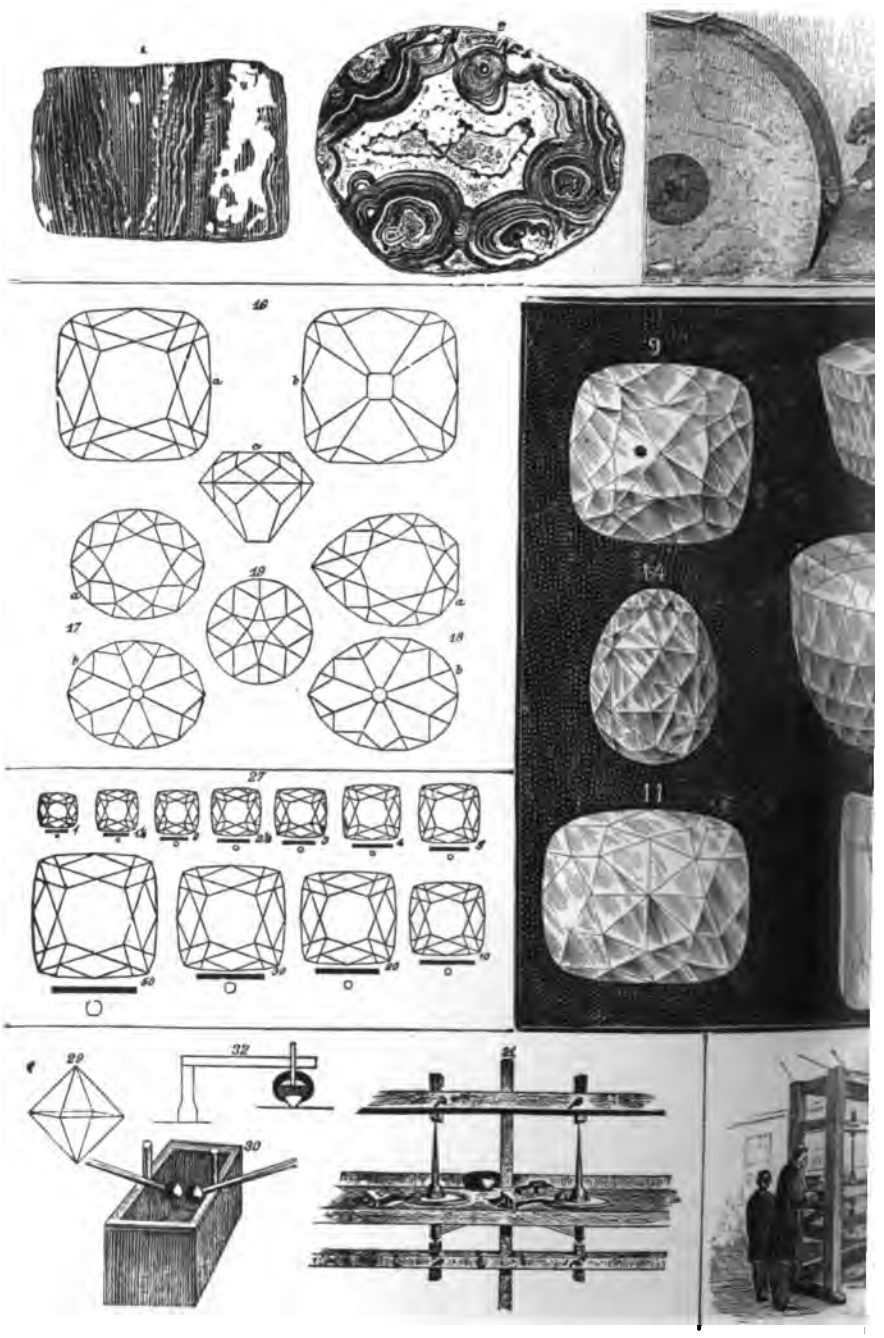
1, the Koh-i-noor; 2, Regent or Pitt diamond; 3, Grand Duke; 4, 5, vertical and lateral appearance of the brilliant diamond; 6, 7, vertical and lateral appearance of the brilliant diamond before being recut; 8, 9, vertical and lateral appearance of rose-cut diamond; 10, 11, the table-cut diamond.

There is a way of falsifying diamonds by joining an under part of some other stone to an upper part of genuine diamond. Some varieties of sapphire, hyacinth, and topaz, are often passed off for diamonds. The first two may be distinguished by their greater specific gravity, the latter by its becoming electric when heated. Rock-crystal, and glass or "paste" imitations, are lighter than true diamonds, and less hard and brilliant. The best test of a genuine diamond is hardness. Care must be taken, however, to avoid breaking off its angles, in testing it by scratching other substances with it, as, though hard, it is somewhat brittle.

Some particular diamonds, from their unusual magnitude, or from circumstances of their history, are of such interest as to entitle them to notice. The collection of the late emperor of Brazil is said to contain an uncut diamond—the Braganza diamond—of the enormous weight of 1680 carats, or about 12 ounces; but it is suspected to be only a fine colorless topaz.—Among the largest diamonds known is that belonging to the rajah of Mattan, weighing 367 carats. It is egg-shaped, with an indented hollow near the smaller end. Many years ago, the governor of Borneo offered for it $500,000, two war-brigs fully equipped, a number of cannon, and a quantity of powder and shot. But the rajah refused to part with it, the fortunes of his family being supposed to be connected with it, and the Malays ascribing to water in which it has been dipped the power of healing all diseases. Perhaps the most famous diamond is the Koh-i-noor (q.v.), once a boasted possession of the great Mogul, and now belonging to the queen of Great Britain. It is said to have weighed 900 carats in the rough; but now, after various cuttings, weighs $106\frac{1}{16}$ carats. The Orloff diamond, belonging to the Russian emperor, and which was once the eye of an Indian idol, is said to have weighed, when rough, 779 carats, but is now cut egg-shaped, and weighs $194\frac{3}{4}$ carats.—The Regent diamond, or Pitt diamond, which weighs in its cut state $136\frac{3}{4}$ carats, is unrivaled in its limpidness and its form, its diameter and depth being nearly equal. It was found in Golconda, was brought from India by an English gentleman named Pitt, the grandfather of the first earl of Chatham, and by him sold to the duke of Orleans for £130,000. It decorated the hilt of the sword of state of the first Napoleon, was taken by the Prussians at Waterloo, and now belongs to the king of Prussia.—The Sanci diamond, weighing 106 carats, has a still more interesting history. It belonged to Charles the bold, duke of Burgundy, who wore it in his hat at the battle of Nancy, where he fell. A Swiss soldier found it, and sold it to a clergyman for a gulden. It passed into the possession of Anton, king of Portugal, who was obliged to sell it, the price being 100,000 francs; and it shortly afterwards became the property of a French gentleman named Sanci, whose descendant being sent as ambassador to Soleure, king Henry III. required the diamond as a pledge; but the servant who was carrying it to the king was attacked by robbers on the way and murdered, not, however, till he had swallowed the diamond. His master, fully confident of his faithfulness, caused his body to be opened, and found it in his stomach. This diamond came into the possession of the crown of England, and James II. carried it with him to France in 1688. Louis XV. wore it at his coronation.

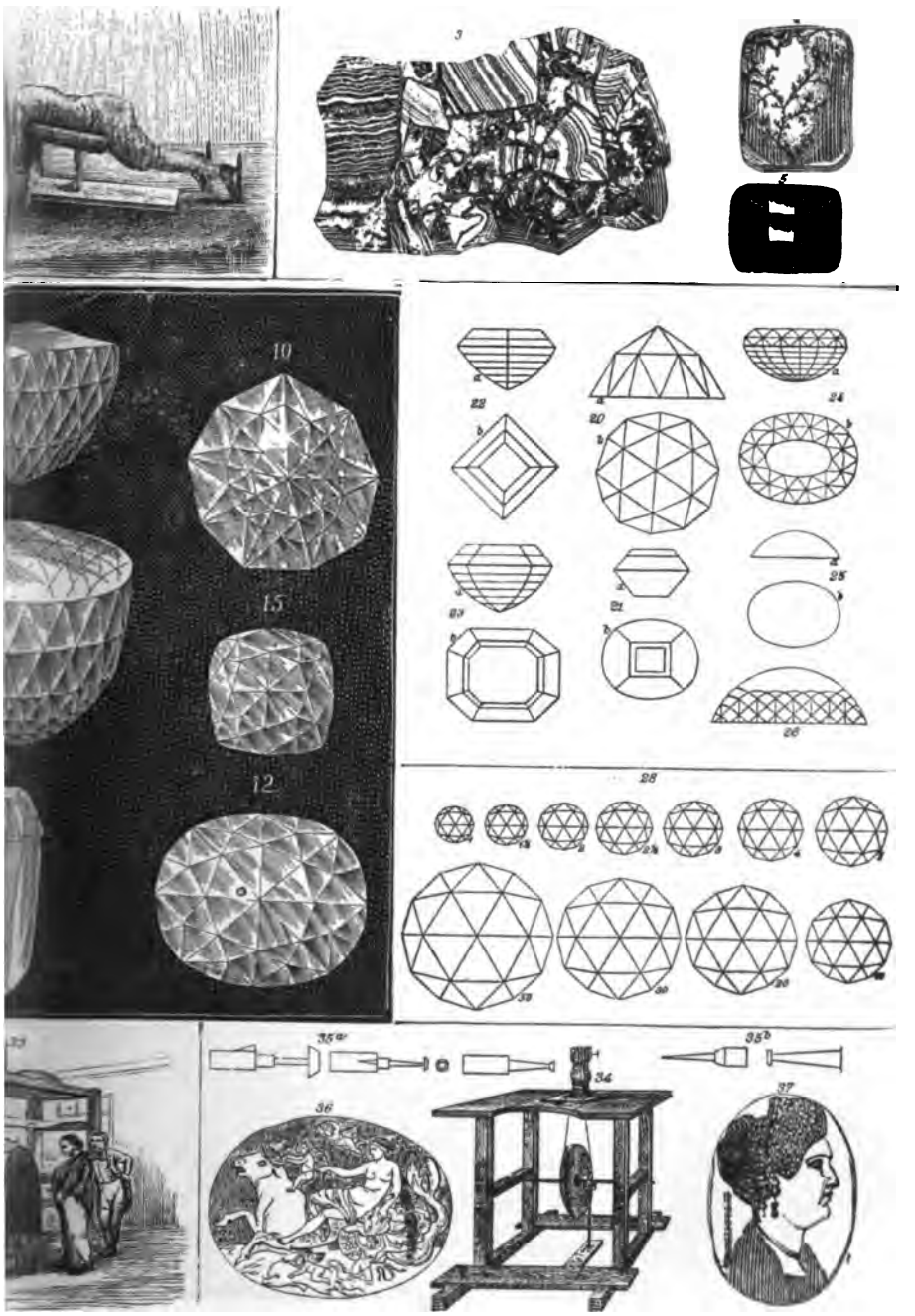
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DIAMONDS, ETC.—1-3. Agates. 4. Mocha stone. 5. Onyx. 6. Agate cutting. Noted Dia
11. Southern-star. 12. Kohinoor. 13. Schah. 14. Sanci. 15. Polar-star. 16-19. Bu
double facets. 25, 26. Buff-top cuts. 27. Brilliants, and 28. Rose-diamonds from 1-50 car
polishing plate. 32. Tongue and dop. 33. Cutting the Kohinoor. 34. Hand-lathe for

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ıds (slightly reduced). 7. Great Mogul. 8. Orloff. 9. Regent. 10. Florentine. nt-cuts. 20. Rose-diamond. 21. Table-stone. 22, 23. Step-facets. 24. Cut with slightly reduced). 29. Primary form of a diamond. 30. Cutting-box. 31. Diamond-e-engraving. 35. Graving-tools. 36. Cameo. 37. Intaglio.

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In 1835, it was purchased by a Russian nobleman for half a million of rubles ($400,000). The Sanci diamond is said to have been the first diamond which was cut in Europe. See adjoining illustration. See *Gems and Precious Stones*, by G. F. Kunz (1890).

DIAMOND BEETLE, *Curculio imperialis*, a beetle or coleopterous insect of the tribe to which the name WEEVIL is generally appropriated, but remarkable for the splendor and exquisite beauty of its colors, in which it is thought to be unrivaled even among coleopterous insects. It is of a golden-green color, with two black longitudinal bands on the thorax, and several rows of depressed spots on the elytra (wing-covers), which exhibit a beautiful and sparkling green with intervals of black. It is a native of warm parts of South America.

DIAMOND HARBOR, the port of Calcutta for large ships, is situated on the left side of the Hoogly, about 30 m. below the capital, with which it is connected by an excellent road and by electric wires.

DIAMOND NECKLACE, THE, a wonderful piece of jewelry, made in Paris about the year 1775, and intended for Madame Du Barry, the favorite of Louis XV. She, however, was excluded from court on the death of Louis (1774), and before the necklace was finished. After being made, this beautiful ornament, adorned with 500 diamonds, was discovered to be so costly that no one could purchase it. It was valued at 1,800,000 livres, which in present sterling money is equal to about £80,000.

The prince-cardinal de Rohan, a wealthy, vain, and profligate man, persuaded by a woman named De Lamotte, who waited about court, that the queen (Marie Antoinette) regarded him with an eye of favor, became so infatuated with the idea that he was ready to do anything, however extravagant, in order to preserve this feeling in the queen. De Lamotte had stated to the cardinal that the queen was desirous of obtaining this glorious necklace, and that not having sufficient money just then, she would sign an agreement to purchase it if the cardinal would become security. The cardinal consented. The agreement was approved of and signed with the royal signature, as also with that of the cardinal, who, on the 1st Feb., 1786, carried off the treasure to Versailles, where it had been agreed the queen should send for it. On the following day, a person dressed in the uniform of one of the court valets, entered the apartments of the cardinal, and repeating as he entered the words, *de par la reine*, "in the name of the queen," he advanced to the table whereon the casket containing the treasure lay, and bore it away. In a few days De Lamotte, her husband, and the *soi-disant* valet, having all disappeared from Paris, were busily engaged separating the diamond necklace into portions, and selling them. The whole transaction had been a trick; the messages from the queen, verbal and written, were without foundation, the latter, indeed, being forged by the "valet," who was skilled in imitating handwriting. The plot was discovered by means of the maker of the diamond necklace, who, not receiving any money when the period of the first installment had arrived, went to court, demanding to know if the necklace had been delivered to the queen. In a few months the cardinal found himself in the Bastile, where those by whom he had been duped were already sent. In May, 1786, the trial of the prisoners was brought to a close. De Lamotte was branded on each shoulder with the letter V (for *voleuse*, thief), and was sentenced to be imprisoned for life. All the others were acquitted. The queen was falsely supposed by the populace of Paris to have been implicated in the plot, and the odium resulting from it was cast upon her, even at the last hour of her life.

DIAMOND WEDDING. See WEDDING ANNIVERSARIES.

DIAN'A, a Roman goddess, corresponding in most of her attributes to the Grecian Artemis. According to the myths, she was the daughter of Jupiter and Latona, and the twin-sister of Apollo. She was born, along with her brother, on Mt. Cynthus, in the isle of Delos, which till then had been a floating island, but was fixed by Neptune in its present place, that Latona might there give birth to her children in peace and safety from the persecutions of the jealous Juno. D. was worshiped by Greeks and Romans alike, as both a destroying and a preserving goddess. In the former capacity, she was represented as a full-grown virgin, armed with bow and arrows, with which she avenged herself on her enemies; as a preserving deity, she watched over the sick, and helped the unfortunate. Young girls, and women in childbirth, were the objects of her special care. She was herself beyond the allurements of love; and the ministers of her worship were vowed to lives of the strictest chastity. As sister of the sun-god Apollo, D. was regarded as the goddess of the moon; hence her Greek name *Selene*, and her Latin names *Lucina* and *Phœbe*. Her worship was conducted with splendid rites in different cities. Her temple at Ephesus was one of the seven wonders of the world. In Tauris (the Crimea), she was propitiated with sacrifices of human victims; and before her statue at Sparta, the public scourging of the Lacedæmonian youth used to take place. In Arcadia, she was looked upon as the special patron of hunting and all sylvan sports, and as such was represented in Greek works of art as a tall and handsome maiden, with long hair floating down her neck, drawing an arrow from her quiver with one hand, and with the other holding in a struggling deer. As goddess of the moon, she wears a long robe reaching to her feet, and bears on her brow a crescent moon. See Illus. MYTHOLOGY, vol. X.

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DIANA, TEMPLE OF, at Ephesus, a magnificent structure built at the public charge, and recorded one of the seven wonders of the world. Chersiphron was the chief architect. According to Pliny, 220 years were spent before it was completed. It was 425 by 225 ft., covering more than two English acres, supported by 127 columns of white marble, 60 ft. high, each weighing 150 tons, and presented by as many kings. On the night of the birth of Alexander, it was fired by Erostratus, an obscure person, who did it solely to secure immortality for his name, and ever since "the aspiring youth who fired the Ephesian dome outlives in fame the pious fool who built it." Having been rebuilt, it was again destroyed by the Goths, 256 A.D.

DIAN E DE POITIERS, 1499–1566; Duchess of Valentinois and mistress of Henry II. of France. When but 13 years of age she was married to the count of Maulvner, grand seneschal of Normandy, by whom she had two daughters. Her father was condemned to death for favoring the escape of the constable de Bourbon, but her tears and her beauty so prevailed with Francis I. that the father's life was spared. She was a widow 32 years old when she became the mistress of Henry (then dauphin), who was but 13 years old. At that time the duchess d'Etampes was the favorite of Francis, and the two women ruled the court; but when Henry became king, Diane was the real ruler, and at once sent her rival into exile. Notwithstanding the beauty and the rights of his wife, Henry was controlled by Diane during his whole reign. After his death she disappeared from public sight.

DIANO D'ALBA, a t. of the province of Cuneo, Piedmont, Italy. Pop. about 3000.

DIAN'O MARINO a t. of southern Italy, in the province of Porto Maurizio, Liguria, Italy, 18 m. e.n.e. of San Remo. Pop. about 3000.

DIANTHUS. See PINK.

DIAPA'SON, a term in music by which the ancient Greeks designated the octave. In modern music, D. is used to denote the range, or compass of the voice, or of an instrument. The French use the term as equivalent to *pitch*. D. is also the English name given to certain stops of pipes in the organ, of 8 ft. pitch, which are considered the fundamental stops, of which there are generally two—a stopped D. and an open D. on each manual. See ORGAN.

DIAPA'SON REGULATOR. The French, who give the name of *diapason* to the tuning-fork, have lately made attempts to use that instrument in connection with clockwork, partly as a means of counting very small intervals of time. M. Duhamel made an arrangement in which a cylinder, by means of a screw-tapped end, was made to advance a little in the direction of the axis; this cylinder was covered with blackened paper, and was rotated by means of clockwork. A diapason had a style or marker, made of a small bit of pointed spring, fixed to the end of one of the prongs. On the diapason being sounded in the usual way, and the spring placed lightly against the cylinder, the style traced a sinuous white line on the black paper. The sinuosities became visible representatives of minute intervals of time, the prongs vibrating possibly hundreds of times in a second. M. Lissajous devised an electrical apparatus to prolong the vibrating of the prongs; but it was too complexed for practical use. M. Breguet then proposed clockwork for this purpose, superseding the pendulum and the spiral spring by a diapason. The diapason regulates the rate of motion of the train of wheels by the equability of the vibration of the prongs, while the train of wheels tends to increase the time during which the prongs vibrate and sound. An index carried by an arbor round a dial, may be made to count or record the vibrations. Breguet's experiments have gone as far as instruments giving 200 simple vibrations (100 double or to-and-fro vibrations) per second. There are means of making the diapason more or less acute in sound, or with a greater or less number of vibrations in a second, by mechanical treatment of the prongs: it can, by a proper distribution of metal, be made to yield any required note within certain limits; and thus, with the aid of the style, the paper, and the cylinder, it may be made to give a kind of visible existence to excessively minute intervals of time, such as $\frac{1}{100}$th part of a second. Fuller details are given in Breguet's description of the apparatus in the *Revue Chronometrique*.

DI'APER (Ital. *diaspro*), a term derived from *jasper* or *diasper* (see letter D), which stone being much used in ornamenting jewelry, originated the Mid. Lat. name *diasprus*, for a texture ornamented or variegated in an analogous way. In textile manufactures, the term is applied to fabrics with patterns of geometrical regularity, such as are produced by the kaleidoscope, woven in their texture, and produced with shafts and heddles, without the Jacquard machine. In architecture, DIAPER-WORK, or DIAPERING, is a kind of decoration applied to plane surfaces, and consists of a small pattern either of flowers, leaves, or arabesques, carved or painted. The flower, or other object, is generally inclosed in a small frame, and these frames, which touch each other at the edges, constitute in themselves a sort of mathematical diapering. When the pattern is carved, it is generally sunk; and when painted, it consists of a darker shade of the same color as the plane surface, by which the effect of shadow is communicated to it.

DIAPRÉ is applied in heraldry to fields and charges, relieved by arabesque and geometrical patterns. These patterns were generally of a darker shade of the same

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tincture. This being merely an ornamental device, not affecting the heraldic value of the objects to which it was applied, was generally left to the fancy of the painter.

DIAPHAN'OSCOPE (Gr. *diaphanos*, transparent; *skopeo*, I see), a dark box, suitably constructed for exhibiting transparent photographs or other pictures. It may or may not be furnished with a lens.

DIAPHORE'SIS (Gr.), the cutaneous perspiration, whence

DIAPHORET'ICS, remedies to excite the secretions of the skin. The simplest of all D. are baths, which may be either warm baths of water, or of vapor, either simple or medicated. See BATH. The most powerful of all, however, as regards educing perspiration, is probably the so-called Turkish bath, which consists essentially in the use of a sweating process, by means of air heated to a temperature of 140°, or even more. The following remedies, used internally, are powerful D.: antimony, ipecacuanha, opium (these three either singly or in combination); ammonia, and the carbonate or acetate of ammonia (spirit of mindererus), sarza, guiacum, dulcamara, and sassafras. On most of these substances, special articles will be found. A favorite formula is Dover's powder, consisting of a grain of opium, and a grain of ipecacuanha in each ten grains of the powder. This in doses of from five to eight grains, followed by warm drinks and plenty of blankets in bed, usually produces copious perspiration, and is very soothing and useful in many commencing inflammatory and febrile complaints. James's powder, in doses of from 3 to 8 grains, is often added to the above in domestic prescriptions; but neither of these medicines should be used rashly, as in certain states of the system they may prove dangerous; and they should never be given to very young children.

DI'APHRAGM (Gr. *diaphragma*, a partition). This is the name applied in anatomy to designate the transverse muscle which, in man and the mammalia generally, separates the cavity of the thorax or chest from that of the abdomen or belly. In form, it is nearly circular; it is fleshy at its edges, tendinous in its center, and ending in a point below. In front, it is attached to the ensiform cartilage of the sternum, or breast-bone; laterally, to the inner surfaces of the six lower ribs; and posteriorly, to two tendinous arches on either side, termed the *ligamenta arcuata*, and to the anterior surface of the bodies of the second, third, and fourth lumbar vertebræ on the right, and only the second and third on the left side; these origins from the vertebræ forming two large fleshy bellies (termed the *crura*), which ascend to join the central tendinous portion. The D. presents three principal openings: one quadrilateral, in the tendinous center, for the upward passage of the inferior vena cava; one of an elliptic shape, formed by the two crura for the œsophagus and pneumogastric nerves; and a third for the aorta, the azygos vein, and the thoracic duct.

The diaphragm is in relation superiorly with the pleuræ and pericardium, inclosing the lungs and heart; inferiorly, on the left side with the stomach and spleen, on the right with the convex upper surface of the liver; posteriorly, with the kidneys and supra-renal capsules and the duodenum; and by its circumference with the ribs and intercostal muscles, with the sternum, and with the vertebral column.

It is convex superiorly, and concave inferiorly. When it contracts, its upward convexity approximates to a plane surface, and the cavity of the chest being thus enlarged, air rushes in to fill the partial vacuum, and expands the lungs during the act of inspiration. It is thus an inspiratory muscle, and is the sole agent in tranquil inspiration. The enlargement of the thoracic cavity caused by the contraction of the diaphragm, must obviously be associated with a corresponding diminution of the abdominal space. Hence this muscle, by its action on the abdominal viscera, aids in the expulsion of the fæces and urine.

Spasmodic action of the diaphragm produces hiccough and sobbing; and in laughing, the alternate contractions and relaxations of this muscle occur with increased rapidity. Stoppage of the action of the diaphragm, whether from great external pressure or from paralysis, is very speedily fatal.

DIAPHRAGM, a partition with a hole in it, employed, not only in landscape and portrait lenses for photography, but also in telescopes, microscopes, and other optical instruments, for the purpose of cutting off the superfluous rays of light, and producing greater intensity or sharpness of the image, as well as to correct aberration.

DIAPHRAGM SHELL. See SHELL.

DIARBEKIR, a t. of Asiatic Turkey, capital of a vilayet of the same name, is situated on the right bank of the Tigris, at a short distance from the river, the intervening space being occupied by rich gardens; lat. 37° 55′ n., long. 39° 52′ east. The town, which is circular in shape, covers a considerable area, and is surrounded by high strong walls, flanked with towers, and pierced by four gates. The streets are dirty, and the houses for the most part are built of rough stone, plastered with a composition of mud and straw, but some of the better class are of black basalt. It has numerous handsome mosques, khans, and bazaars, and several Christian churches. Extensive manufactures of silk, cotton, and other goods, affording, with an active commerce between Aleppo and Bagdad, employment to about 40,000 families, were at one time carried on here; but the manufactures and trade have now greatly declined, and the population of D. is now estimated at from 35,000 to 40,000 of whom two-thirds are Mohammedans, the rest

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being Greek, Armenian, Catholic, and Jewish. It manufactures red and yellow morocco, and silk. D. occupies the site of the ancient *Amida*, which was a place of importance in the reign of Constantius, by whom it was strengthened and enlarged. In this reign it was taken by the Persians, from whom it was again captured by the Romans; but in 502 the Persians once more became masters, and put 80,000 of the inhabitants to the sword. After many vicissitudes, it passed into the hands of sultan Selim in 1515. Many Roman and Saracenic remains still exist here.

DIARRHE'A (Gr. *dia*, through, and *rheō*, I flow), a disease or rather a tribe of diseases, characterized by an increase in the discharges from the bowels, which are usually unduly liquid, sometimes overcharged with bile, and sometimes the contrary. Diarrhea has many varieties and many causes; but the whole tribe of diarrheal diseases present certain relations in common, which have been studied of late years to a considerable extent from the preventive or sanitary point of view. Thus, it is observed of all of these diseases, without exception, that they are more apt to prevail during summer and autumn than during the earlier seasons of the year; and it is also well established that their prevalence is to a great extent dependent on the intensity of the solar heat, so that a temperature above 60° F. seems to be almost essential, under ordinary circumstances, to their epidemic diffusion. Moreover, it has been shown that the decomposition of organic matters in the neighborhood of human dwellings, and the introduction of the products of decomposition into the food, drink, or air used by the healthy, has been a direct exciting cause of diarrhea in a great number of instances where the dis ease has been locally epidemic; from which it is inferred that the real source of diarrheal diseases is usually to be found in a morbid poison closely associated with the process of putrefaction, although not, perhaps, necessarily generated during that process. It has been noticed that cold and wet seasons are the least favorable to the production of diarrhea, which is explained on the theory above alluded to by the rapid removal in such seasons of all organic débris; and there is little doubt that this explanation is correct, as the converse is equally true, the combination of heat with long continued drought being almost sure to waken into life the epidemic seeds of diarrhea. Again, it is noticed that where drainage is imperfect, and drinking water impure, diarrheal diseases are specially apt to occur (see CHOLERA); the class of the population most apt to be affected being those who occupy low levels, or who are otherwise exposed to the influence of this aqueous or gaseous poison. Infants are especially apt to suffer from diarrhea, and a large number of the infantile deaths in many English towns are caused either directly by this disease, or by the abuse of stimulants and narcotics for its cure.

Diarrhea is either simple, bilious, or choleraic; the last form has already been discussed. See CHOLERA. The ancients applied the name *lientery* to a diarrhea in which the dejections consisted of matters not digested, or very partially so; this form is, however, very unusual, at all events in this country. Dysentery (q.v.) is also a form of diarrheal disease; as is the form of fever (q.v.) called gastric, typhoid, or enteric fever. Simple and bilious diarrhea probably often differ only in degree; they are both distinguished from the advanced stages of cholera and dysentery by the presence of abundance of biliary coloring matter in the stools, and by the absence of the distinctive features of the other two diseases as described elsewhere. Diarrhea frequently depends on organic disease, either of the intestines themselves, or of the liver, kidney, or spleen. It is also one of the most common symptoms of the advanced stage of consumption (q.v.).

When diarrhea is plainly the consequence of improper food or drink, when it is very recent, when the strength of the patient is not much impaired, when there is much griping pain or distension of the belly, when the evacuations are very unnatural in character, and especially when they are dark colored and very fetid; when the disease has been preceded by habitual constipation (q.v.), and when there is no organic disease to be discovered, it is well to let diarrhea run its course, at all events for a time, and either to aid it by small doses of very simple laxatives, or, at all events, to abstain from hastily checking the discharge, which in these cases is to be regarded as a truly curative and beneficent process, calculated to disburden the system of some poisonous or deleterious substance, and only requiring time for the restoration of the patient to health. In other cases, especially of febrile diarrhea, an emetic of ipecacuanha at the very beginning will sometimes remove the disease with remarkable rapidity; and in most forms of diarrhea it may be alleged that this medicine (in doses of from one to five or even ten grains) is well borne. Sometimes it is combined with opium in the form of Dover's powder. Vegetable astringents, as catechu, kino, tannin, matico, logwood, are also much employed both in acute and chronic cases; some prefer the acetate of lead, with opium (which, however, is perhaps more suitable to dysentery). It should be observed that in some forms of diarrhea the use of opium, though a most powerful remedy, is contraindicted by the state of the constitution; it should in no case be largely given without medical advice. In many chronic cases the metallic tonics and astringents are of service—e.g., iron, sulphate of copper, zinc, and bismuth. In a very large class of cases, especially of infantile diarrhea, depending upon a too acid state of the secretions, the leading remedy is chalk, either in powder or in the very serviceable form of the mistura cretæ (mixture of chalk) of the pharmacopœias, from one to three dessert-spoonfuls of which may be given after every disturbance of the bowels. Lime-water,

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mixed with milk in the proportion of one to four or five, is easily given to very young children, and serves nearly the same purpose.

DI'ARY (Lat. *diarium*, from *dies*, a day), means simply a daily record. It does not, however, comprehend every sort of daily record, but only such as have reference to the writer personally. In it the *littérateur* inscribes the daily results of observation, reading, or thought; to the mercantile man, it serves the purpose of an order or day book; while the physician finds it indispensable as a register of engagements. The use of diaries has become so general, especially in England, that the making of them now forms an important branch of the book-manufacture. Letts & Co., of London, issue annually upwards of a hundred varieties of diary, from the large folio to the smallest pocket volume. The usual diary may be described as a book with a separate blank space for every day in the year, these spaces varying in size and form, as the particular bent or profession of the diarist may render necessary. Bound up with these diaries is a summary of the important events of the past year, a list of the acts of parliament passed during the previous session, an enumeration of public holidays, terms, etc., a great amount of valuable information regarding banking and insurance businesses, with a vast quantity of miscellaneous memoranda, so that the proprietor possesses in one book a D. and an almanac.

Diaries have often furnished the historian with invaluable material, supplying the absence of public records, and furnishing minute and graphic details of the social condition and of the secret springs of public events that are not to be looked for in more formal records. Perhaps the most notable in this respect are the diaries of Evelyn and Pepys.

DIASCHIS'MA, the Greek name of a small musical interval which only appears in the mathematical calculation of greater intervals. The D. is, (1) the difference between the great half tone and the small *limma*, or the remainder when the latter is subtracted from the former, 2,048:2,025; (2) the difference between the *diesis* and the *syntonic comma*, also 2,048 : 2,025. The D. and the small *limma* added together always make the greater half tone, or 16 : 15; and the *syntonic comma* added to the D. always make the *diesis*, 128:125.

DI'ASTASE is a peculiar ferment developed during the germination of all seeds. An impure solution of D. may be procured by adding one part of hot water to two parts of ground malt (see BEER), or freshly germinated barley, and, after standing for a short time, straining through a cloth. The proportion of D. in malt is not more than 1 part in 500 parts, and yet it performs important functions. Thus D. has a powerful action upon starch, and at a temperature of 150° Fahr. 1 part is considered powerful enough to change 2,000 parts of starch into dextrine, and then into grape sugar. When obtained separately, D. is a white tasteless substance. See GERMINATION.

DIATHERMANCY, a word used to express that quality in bodies by which rays of heat are allowed to pass through them; in other words, it may be called "transparency" to heat. More correctly speaking, D. has the same relation to radiant heat that transparency has to light. Bodies which have the property of D. are called diathermanous bodies. The earliest observers of the phenomena of D. supposed that the diathermanous body absorbed the rays of heat and then gave them out; but the fallacy of this idea was shown by Prévost, who ignited substances by rays of heat after passing them through ice. The phenomena of D. have, however, been more extensively examined by Melloni, Tyndall, Bunsen, Kirchhoff, and Balfour Stewart. The experiments of Melloni, who was the pioneer in the investigation, were of a brilliant character, and the apparatus used by him is a good example of that which has been used so effectively of late years in the rapid advancement of modern science. The thermo-electric pile of Nobili was employed to measure the rays of heat, and compare those which were passed through different substances with those passed through air alone. He found, among other things, that rock-salt was almost perfectly diathermanous; there was a loss of only 7.7 per cent, which he attributed to reflection. The following table shows the D. of various solids, and also that their D. varies with the intensity of the heat which is the source of the rays. The substances were $\frac{1}{10}$ of an in. thick.

Substances.	Locatelli Lamp.	Incandescent Platinum.	Copper at 752° F.	Copper at 212° F.
Rock-salt	92.3	92.3	92.3	92.3
Fluor-spar	72	69	42	33
Beryl	54	28	13	0
Iceland spar	39	28	6	0
Glass	39	24	6	0
Rock-crystal	38	28	6	3
Smoky quartz	37	28	6	3
Carbonate of lead	32	23	4	0
Sulphate of baryta	24	18	3	0
Feldspar	23	19	6	0
Borate of soda	18	12	8	0
Selenite	14	5	0	0
Alum	9	2	0	0
Ice	6	0.5	0	0

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The equal D. of rock-salt to the rays of heat of different degrees of intensity as shown in the above table was taken by Melloni as evidence that its D. was perfect. Rays of very low refrangibility, however, will not all pass through rock-salt. Fluor-spar is seen to be comparatively diathermanous, but Iceland-spar and glass show very great variation in D. to rays of different intensity. Feldspar does not vary much in property from them, but alum and ice are almost completely *athermanous*. The following list shows the percentage of rays transmitted through liquids, held in glass cells, $\frac{1}{10}$ of an inch thick:—Bisulphide of carbon, 63; bichloride of sulphur, 63; oil of turpentine, 31; olive-oil, 30; naphtha, 28; oil of lavender, 26; sulphuric ether, 21; alcohol, 15; acetic acid, 12; distilled water, 11.

After rays of heat have been passed through a body, it will then pass through a second body of the same kind, a phenomenon which might be expected from the nature of radiation. The rays being already sifted, and those transmitted which the molecular structure of the body will allow to pass, they possess the wave-lengths required to make their way between the molecules of the medium. Another quality rather more remarkable, which bodies possess, is, that they are athermanous to rays of heat which are generated in the same substance. Thus rock-salt is nearly athermanous to heat radiated by rock-salt. The absorbing and radiating powers of bodies are reciprocal and equal; therefore the D. of a body is inversely proportional to its radiating power. The investigations of Tyndall on the D. of various liquids and gases possess great interest. He found that as a rule elementary bodies were more diathermanous than compound bodies. A solution of iodine in bisulphide of carbon placed in a prism of transparent rock-salt was found to transmit 99 per cent of all the rays of heat emitted by a non-luminous body. Elementary gases and their mixtures were found almost perfectly diathermanous, while many compound gases were diathermanous only to rays containing much light. The amount of heat transmitted by nitrous oxide gas is only $\frac{1}{110}$th of that which will pass through dry common air, a proof that the atmosphere is merely a mechanical mixture. The following list shows the relative absorbing power of various gases, or their D. in inverse proportion: Air, 1; oxygen, 1; nitrogen, 1; hydrogen, 1; chlorine, 39; hydrochloric acid, 62; carbonic oxide, 90; carbonic acid, 90; nitrous oxide, 355; marsh gas, 403; sulphurous acid, 710; olefiant gas, 790; ammonia, 1195. These gases are all perfectly diathermanous to luminous heat. The above numbers were obtained only with heat of low refrangibility. These gases were held in tubes of rock-salt. If glass had been used, it would already have sifted out all the rays to which these gases are athermanous, and the results above indicated would not have been obtained. Ozone, which is an allotropic condition of oxygen (q.v.), was found to be very athermanous. But on heating the ozone it became perfectly diathermanous like oxygen. This proves that ozone is not, as some have supposed, a compound of oxygen and hydrogen, because the heating would produce some vapor, and this would prevent the contents of the tube from being diathermanous, for aqueous vapor was found to be quite opaque to the dark rays of the spectrum, although diathermanous to the luminous rays. The subject of D. has much interest in relation to the study of meteorology, and the effects of moisture on climate.

DIATHER'MANOUS. See HEAT.

DIATH'ESIS (Gr. *dia*, through, and *tithēmi*, I place or arrange), a Greek word signifying a disposition or arrangement, and applied by the old medical authors to the predisposition or constitution of the body which renders it prone to certain diseased states. Thus the tubercular, scrofulous, gouty, rheumatic, cancerous, or calculous diatheses, are described as something different from the corresponding diseases, but leading to these as natural or probable consequences, under certain conditions or exciting causes. The study of diathesis apart from existing disease, however, is almost always unsatisfactory, and leads to over-refinement and the pursuit of intangible abstractions, without due regard to evidence; inasmuch as the existence of a state which *is not* disease, but *leads to* disease, can rarely be established upon an unassailable basis.

DIATOMA'CEÆ, or DI'ATOMS, a group of organized beings, now generally regarded as belonging to the vegetable kingdom, and ranked as a sub-order of *algæa;* but formerly reckoned among animalcules, a view of their nature still entertained by some naturalists. Lindley makes D. an order of his *algal alliance* of thallogenous plants, including *desmidieæ* (q.v.) as a sub-order, and distinguishing the true D. as another sub-order, under the name *cymbelleæ*. The D. are generally of a brown color, although they not unfrequently become greenish when dry. They are remarkable for their silicious covering, composed of two pieces or valves, and their angular shape, and are among the most beautiful and interesting of microscopic objects, exhibiting great variety of markings—striæ, dots, etc.—regularly and symmetrically arranged. The valves, or pieces of the siliceous covering, are always equal in length, but their sides often differ much in breadth. All within appears to be only a single cell; but many of these cells are often united or in contact, according to some mode of arrangement characteristic of the particular species. D. are found both in salt and fresh water, also on the surface of damp rocks and walls, garden-paths, flower-pots, the glass of hot-houses, etc. They may generally be obtained in great numbers by allowing water in which they exist to stand for a few hours, and then pouring off all except the more muddy or slimy part at the bottom.

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They may often be seen to move a little in the water or slime in which they exist, particularly those of most elongated form; and this was once regarded as a very conclusive evidence of their animal nature, but is now believed to be no more so than the movements of vegetable zoospores, and to be owing to their imbibing and emitting fluids in the processes of their vegetable life. They increase by division (whence the name diatomaceæ, Gr. through-cutting), which takes place not transversely but longitudinally; and the lines which mark its progress are almost always visible in them. In this process, new silicious valves are formed along the line of division, the old valves remaining on the outer sides, and each new diatom cell having an old valve and a new one. True reproduction takes place by conjugation (q.v.), and by the formation of *sporangia* (see SPORE). D. very rapidly putrefy, but their silicious shields resist decomposition more perfectly than almost any product of organic nature, and are found in immense numbers in many marls, clays, and rocks. They are capable of resisting even the action of fire, and of the gastric-juice of the stomachs of animals, and are found in pumice and volcanic ashes, and in guano. The abundance of the D. as existing organisms, corresponds with what we infer from their remains in the oolite, chalk, etc., as to former geological periods. Britain is known to possess hundreds of existing species. Dr. Hooker found them in such numbers in the Antarctic ocean as to give an ochreous brown color to its surface as far as the eye could reach, and to the icebergs floating in it; whilst a submarine deposit is in process of formation, composed of their silicious shields. Thus these minute organisms, unimportant as they may be deemed individually, fill no insignificant place, collectively, in the general scheme of creation.

Fossil D. have been observed in strata of every age. Though so minute in the individual, they form, in the aggregate, considerable thicknesses of rock—they have, in fact, in common with the associated and nearly as minute and simple organisms of the animal kingdom, the foraminifera, produced greater changes, and left more lasting records than any effected by higher members of either kingdom. In the older rocks, D. have not been noticed in any quantity, their existence, however, in the clay-slates of the lower Silurians was discovered by Mr. A. Bryson, and has been subsequently noticed by other observers. In tertiary strata they occur in abundance. There is good reason for believing that the silicious substance of flint was obtained, to a large extent, from these organisms; many of their frustules may yet be discerned in it. Tripoli-stone consists entirely of their silicious plates, hence its value as a polishing agent. Several extensive deposits of tripoli are found in Bohemia—one at Egea is two miles in length, and averages 28 ft. in thickness; another at Bilin, forming the upper layer of a hill, is 14 ft. thick; it is composed chiefly of a species of *gallionella*, with specimens of *naviculæ*, etc., as many as forty-one thousand millions exist in every cubic inch of the stone! The city of Richmond, in Virginia, is built on a stratum of diatomaceous earth, 18 ft. thick. Similar deposits are found in different localities in Britain, as at Premnay, Dolgelly, Lough Mourne, Raasay, and Mull. From the last locality, Gregory has given a catalogue of 150 species. The whitish powder of which the deposit consists is called in Sweden Bergmehl (q.v.), and is, in seasons of scarcity, mixed by the poor with their food, though probably without any advantage, save increasing its bulk. D. occur in more or less abundance in marl, peat, guano, estuary mud, and other recent deposits.

DIATON'IC, a term used in the science of music, originally from the Greek, meaning "by tones," or "from tone to tone." The diatonic species of the ancient Greeks—apart from their chromatic and enharmonic species—formed the foundation of their whole system of music, and was arranged in tetrachords composed of one semitone and two whole tones. The diatonic scale of modern music is a combination of the Greek tetrachord, forming a succession of sounds progressing from degree to degree, by tones and semitones in a certain fixed order, neither omitting nor repeating; the position of the semitones varying, as the scale is major or minor.

DIATON'IC SCALE OF COLORS, the seven primary colors of a solar spectrum, or rather the spaces occupied by them, which Newton supposed to be of the same length as the strings that sound the diatonic scale in music. The theory is not well founded.

DI'ATRIBE (Gr. *diatribè*, a disputation, or critical exercise) was a name originally given to a critical examination of a literary work, and at a later period to a bitter and violent criticism, either written or spoken, on any subject, in any department of literature.

DIAZ, BARTOLOMMEO, a Portuguese navigator of noble birth, who flourished during the latter half of the 15th century. His residence at the court of king John II. brought him into contact with many scientific men, among others the German cosmographer Behaim (q.v.). D. took a great interest in geographical discovery, and his knowledge and abilities were so highly estimated, that the king gave him the command of two vessels with a view to following up the discoveries already made by Portuguese adventurers on the w. coast of Africa. D. soon reached the limit which had been attained in s. Atlantic navigation, and first approached land in 26° s. lat. After disembarking at various places, and taking possession of the shores in the name of the Portuguese king, he sailed round the southern extremity of Africa without suspecting it, and cast anchor at the mouth of the Great Fish river, a little to the e. of Algoa bay. A storm now rose, and drove him into Algoa bay. He there found, near Port Elizabeth, his

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companion-vessel, from which he had been separated before rounding the cape; but unfortunately the greater part of its crew had been murdered by the blacks. He now, for the first time, noticed his discovery, and called the cape, in remembrance of his danger, *Cabo de todos los tormentos* (Cape of all the Storms)—a name which the king of Portugal afterwards changed into its present, *Cabo de Buena Esperanza* (Cape of Good Hope). D. arrived in Lisbon Dec., 1487, and was at first greeted with enthusiasm, but soon saw Vasco da Gama preferred before him, and was compelled to act under the latter in the grand expedition of 1497. Vasco da Gama even sent him back to Portugal after they had reached the Cape Verd isles, so that he had no share in the honor of discovering a maritime route to the Indies. Three years after, he joined the expedition of Cabral, the discoverer of Brazil, but was lost in a storm, 29th May, 1500.

DIAZ DE LA PEÑA, NARCISSE VIRGILLE, 1807–76; b. Bordeaux, France. An orphan and a cripple from his youth, he struggled against poverty and the opposition of critics, until his first great picture, "The Descent of the Gypsies" (which, remaining unsold for a long time, was finally bought for three times the sum asked), placed him in the front rank of the idealistic school of painters. His best success has been in landscape. Among his many works are, "The Bather," "Love Disarmed," "Last Tears," "Galatea," "Education of Love," "Venus and Adonis," and "A Storm." His painting is of unequal brilliancy, and he has been described as "a great artist, but not a great painter."

DIAZ DEL CASTILLO, BERNAL, a Spanish writer, born near the close of the sixteenth century, at Medina del Campo. He accompanied Cortez to Mexico in 1519, and after the conquest settled in that country. In 1632 he went to Madrid and published his *History of the Conquest of New Spain* (three volumes), important because narrated by an eye-witness. The style of it, however, is far from elegant. See *Memoirs of Bernal Diaz del Castillo*, by himself, and translated by J. Ingraham Lockhart, 1844.

DIAZ, PORFIRIO: b. 1830: Mexican general, statesman, and dictator. His subjection of Oajajo, 1855–60, was an arduous undertaking, whose success won his rapid promotion. Opposing the conservatives, under Don Ignacio Comonfort, he led in establishing the constitution of 1857. He embraced the nationalist cause against the empire set up by the French in Mexico; and although commanding a mere handful of men insufficiently equipped, he gained more than one victory; escaped from capture, 1865; retrieved his losses; and forced the enemy to capitulate, 1867. He had held the governorship of Vera Cruz, and the command-in-chief of the army, and had declined the ministry of war. In 1867 he was a candidate for the presidency, but was defeated by Don Benito Juarez; and immediately began a series of intrigues which led to the revolutions of 1868–72. His plots against President Lerdo, 1876, resulted in the flight of the latter, and in the assumption of dicatorship by D. His government was recognized by the U. S., 1878. He was elected president in 1884; re-elected, 1888, 1892, 1896.

DIBBLE AND DIBBLING. The common garden dibble is an implement too well known to require any lengthened description. A round piece of wood, about an inch and a half in diameter, sharpened at the point, is the most simple and common form. To allow it to be more easily pressed into the ground, a handle is usually added. This is all that is needed for a garden dibble. In some parts of England, where labor is plentiful, large breadths of wheat are put in with the dibble. Several dibbles are usually joined together, and made of sufficient length to enable a man to perform the operation, as he walks backwards, without much stooping. Children follow with the seed, and drop two or three grains of wheat in every hole. The dibbler is often used to put in beans. By dibbling, a considerable saving of seed is effected. From one bushel to six pecks of wheat is the usual quantity required to sow an acre. Dibbling is thought to be advantageous for light lands which are in good condition. More recently, several ingenious machines for dibbling have been constructed. The one most worthy of notice is Newberry's horse-dibble, which sows from one to seven rows, and accomplishes the operation with great nicety and accuracy. Being an expensive machine, however, it has not come into general use. Dr. Newington has invented a hand-dibble, a very perfect implement of its kind; the same machine makes the holes and deposits the seed at once. This has been a useful article on small holdings, and it is the greatest favorite at the present moment.

Dibbles of every kind are unsuitable for stiff or clayey soils; the soil, compressed and hardened around the hole which they make, not readily admitting the young fibers of the root, and retaining water to the injury of the young plant.

DIBBS, the English name of a game of great antiquity, played by boys and girls; and in Russia, as is described by Dr. Clarke, it is played sometimes even by old men. It consists in throwing up the small joint-bones of the legs of sheep, and catching them first on the palm and then on the back of the hand. The antiquity of this simple kind of play is proved by figures on Grecian vases, on which females are seen kneeling and engaged in the sport. In Scotland, where the game is more usually played with small pebbles or shells, it is called "the chucks."

DIBDIN, CHARLES, musician and poet, was b. at Southampton in 1745, educated at Winchester, and at the early age of 16 made his literary *début* in London, by writing an opera called *The Shepherd's Artifice*, which was produced at Covent Garden theater, of

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which he afterwards became musical manager. In 1789, he commenced giving a series of musical entertainments in the city, entitled *The Whim of the Moment*, which acquired a great celebrity. After several vicissitudes, he withdrew, in straightened circumstances, from public life in 1805, when government granted him, in consideration of his literary merits, a pension of £200. He died in 1814. D. is an admirable writer of sea-songs, of which he composed about 1200. Neptune, and not Apollo, seems to have inspired him. In fact, he is the only song-writer who has reached the heart of "the mariners of England." His verses smack of the briny deep, and reflect with astonishing felicity the easy, childlike virtues and the fearless courage of the English tar. It is known that they had a great effect during the war between France and England in supplying the navy with volunteers, and they have even been quoted in mutinies to the restoration of order and discipline. Among D.'s happiest pieces are *Poor Jack* and *Poor Tom Bowling*. A good edition of D.'s songs, with a memoir by T. Dibdin, illustrated by G. Cruikshank, appeared in 1850 (3d ed. 1863). His sons, CHARLES and THOMAS JOHN, wrote songs and dramas. See E. Dibdin, *The Dibdins* (1888).

DIBDIN, Rev. THOMAS FROGNALL, nephew of Charles D., the famous writer of sea-songs, was b. at Calcutta in 1776. He lost both his parents when hardly four years of age, and was brought up by his mother's brother, a Mr. Crompton. He studied at St. John's college, Oxford, but left the university without taking a degree. After a short and unsuccessful career as a lawyer, he entered the church in 1804, and from that period until his death, 18th Nov., 1847, continued to labor as a bibliographist with a diligence that would have been more commendable if it had been accompanied with a stronger judgment and a greater accuracy. D.'s principal works are an *Introduction to the Greek and Roman Classics* (1802), *Typographical Antiquities*, 4 vols. (1810–19), *Bibliomania* (1811), *The Bibliographical Decameron* (1817), *Bibliotheca Spenceriana* (1814), *Bibliographical, Antiquarian, and Picturesque Tour in France and Germany* (1821), *The Library Companion* (1824), and *Reminiscences of a Literary Life* (1836). All D.'s books contain valuable and rare information, but are far from trustworthy in matters of detail. Many of them are exquisite in typography and artistic decoration.

DIBRANCH'IATES, a division of cephaloid mollusks, having two gills or branchiæ, an ink-gland, and nearly always a rudimentary internal shell, such as the cuttle-fish, the octopus, the squid, and the argonaut, and the extinct belemnites. The female argonaut has a single-chambered shell not connected with the body, for the protection of her eggs. With this exception, they are naked.

DICÆ'UM, a genus of beautiful birds, which are best known in India and Australia. Their nests are purse-shaped and made from the down of plants. They fly with great rapidity, and are remarkable for their sweet and long-drawn-out notes.

DI'CAST, a body of 6000 Athenian citizens chosen annually by lot from the whole people, except slaves, to assist in the administration of justice. They were divided into 10 sections, each section having the powers and performing the duties of a court of justice. The evidence in a cause was taken beforehand, and the members of the D. were kept in ignorance of the cases to come before them, being sworn, as jurors are in the present age, to decide according to the law and the facts.

DICE (plural of die), small cubes of bone or ivory, marked on their six sides with black dots, from one up to six in number. Two dice are employed in certain games of chance, such as backgammon; also in throwing for high stakes, or settling some dispute in which the decision is referred to the highest number thrown. In this latter point, the throwing of dice is equivalent to what is usually spoken of as "casting lots." The throwing of dice is in all cases effected by means of a small tubular box, which, held in the hand, is shaken at will by the player. When the dice are true cubes, there is no plan by which any kind of shaking can bring out a desired number. In order to repress gambling, and secure players against deception, the state, by the act 9 Geo. IV. c. 18, imposed a duty of 20*s.* on each pair of properly made dice, which were accordingly stamped, and a penalty was imposed on the sale of unstamped. Nevertheless there appears to have been a pretty free sale of unstamped dice under the name of "bones" at an insignificant price. In 1862, the stamp-duty was abolished, yet the repeal of the restriction has not to any extent stimulated the use of dice. Unscrupulous gamblers adopt the odious practice of loading dice, by plugging them with lead on a particular side, so that the higher numbers may turn up. Where there is any suspicion of this trick, the thrower should be requested to turn down the mouth of the box abruptly, to prevent the dice from rolling, and improperly adjusting themselves. See GAMBLING.

DICEN'TRA, the name of certain showy herbaceous perennials found in the United States and elsewhere. A curious specimen is known by the name "Dutchman's breeches," because the corolla resembles that article of attire. The flowers are cream-colored, tipped with white. Another species is called "squirrel corn," its tubes resembling maize. It has fragrant flowers, of greenish white tinged with red, and is found in rich forest-lands. There are other varieties, but the most beautiful is an importation from Japan, and is popularly known as "the bleeding heart." It has large rosy blossoms, each flower is an inch long, and its blossoming continues for weeks.

DICHLAMY'DEOUS (Gr. *dis*, twice, and *chlamys*, a covering), a term in botany, applied to those flowers which have both a calyx and a corolla. Flowers in which the

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calyx and corolla are very similar, and unite to form a *perianth*, are dichlamydeous, as well as those in which they are very different. Decandolle divides dicotyledonous or exogenous plants into *dichlamydeous* and *monochlamydeous;* the former including the three sub-classes of *thalamiflorœ, calyciflorœ,* and *corolliflorœ,* whilst the latter form a single sub-class.

DICHOTOMOUS (Gr., divided into two equal parts), a term often used in botanical description to designate branching by repeated forkings. The veins of the fronds of ferns and of the leaves of some coniferous trees, the stems of some ferns, the fronds of some algæ, and the stems of a few phanerogamous plants, are dichotomously branched. The stem of the mistletoe is generally divided in this manner, and it is a remarkable characteristic of that of the doom palm.

DICHOT'OMY, in anthropology, is the name given to the theory that considers man as having a twofold nature, physical and spiritual, or, in popular language, as body and soul. In this it is opposed to *trichotomy,* which makes a triple division—body, soul, and spirit: giving the name "soul" to all, besides the body, which man has in common with brutes, e.g., certain instincts, affections, and rational faculties; and using "spirit" to designate that in man in which his morality and immortality inhere, and by which he is distinguished from the other animals. See SOUL.

DI'CHROISM (Gr. *dis,* twice, *chroma,* a color) is a term chiefly used in crystallography to designate the property which many doubly-refracting crystals possess of exhibiting different colors, when viewed in different directions. It, or the allied term *dichromatism,* has also been applied to those fluids which appear of different colors when viewed by reflected and refracted light; when seen in thick or thin layers, etc. For example, venous blood, or any blood impregnated with carbonic acid, hydrogen, or nitrogen, appears, when seen in moderately thin layers, to be of a purple color; while in extremely thin layers it appears green.

DI'CHROITE, or I'OLITE, a silicate of magnesia, iron, and alumina, found in prisms, and sometimes used as a gem because of its changeable colors.

DICK, THOMAS, LL.D., a well-known religious philosopher, was b. in 1774, near Dundee, Scotland, educated at the university of Edinburgh, and intended for the ministry in connection with the Secession church. After a brief pastorial charge, however, he devoted himself to teaching, lecturing, occasional preaching, and authorship. D. proved himself to be a truly useful writer; but although his productions obtained a great popularity both in England and America, they brought him very little pecuniary return. Towards the close of his life, a small pension was granted him in consideration of his literary services. He died at Broughty Ferry, near Dundee, 29th July, 1857, in the 83d year of his age. D.'s principal works are *The Christian Philosopher* (1823); *The Philosophy of Religion* (1825); *The Philosophy of a Future State* (1828); *Celestial Scenery* (1838); *The Sidereal Heavens* (1840); and *The Practical Astronomer* (1845). Several of D.'s writings have been translated into other languages; one, even into Chinese.

DICK BEQUEST', the name given to a fund bequeathed by James Dick of Finsbury square, London, for the benefit of the parochial school-masters of Moray, Banff, and Aberdeen. Mr. Dick was b. at Forres, Morayshire, in Nov., 1743. Having entered mercantile life in the West Indies at the age of 19, he amassed a considerable fortune, which he subsequently increased in London. He died on the 24th May, 1828, leaving the chief part of his fortune for the purpose above mentioned. The sum bequeathed amounted in 1833 to £113,147 *4s. 7d.,* since increased to £122,000. These funds, being invested in heritable securities, yield (after deducting all expenses) for annual distribution a sum which amounts, on an average, to £4,000. Mr. Dick's object was "to encourage active school-masters, and gradually to elevate the literary character of the parochial school-masters and schools." Acting on this declaration of the testator's wish, the trustees in whom the administration became vested* ordained first, that with a view to raise the literary character of the school-masters, none should, after a certain date, participate in the bequest who had not passed, to the satisfaction of examiners appointed by them, an examination in the English language and literature, geography, arithmetic, geometry and trigonometry, algebra to quadratic equations inclusive, Latin, Greek, history, and chronology. To these branches have lately been added an examination in the art of teaching and in physics. To those who highly distinguish themselves in these examinations, a sum of money is awarded by the trustees, and they are entitled to a small allowance during their term of office.

DICKENS, CHARLES, novelist and humorist, was b. at Landport, in Hampshire, in Feb., 1812. His father, Mr. John Dickens, was employed for some years in the navy pay department, but at the conclusion of the war with France was pensioned, and became a parliamentary reporter. In this pursuit his son was soon distinguished for uncommon ability; and after a literary engagement—at a very early age—upon *The True Sun,* he attached himself to the staff of the *Morning Chronicle.* In this newspaper he gave the first evidence of his talents in the lively essays, entitled *Sketches by Boz,* published in 1836. Encouraged by their success, he undertook to write the letter-press of the *Adventures of Mr. Pickwick,* the illustrations of which were to be executed by the then more famous Mr. Seymour, a comic draughtsman. The result was as though Shakespeare

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had been engaged to write the libretto for an opera of Mr. Balfe's. The *Pickwick Papers*, which had an enormous commercial success, commenced also an era in English literature. It was the first of a series of fictitious works exhibiting the life and manners of the middle and lower classes, which up to that time had had scarcely any exponent. In one respect, however, this book had neither predecessor nor progeny. Neither before nor since has there ever been such a literary embodiment of healthy animal spirits. There is none like it for unflagging but never unwise merriment—for humor that is very much the reverse of dry. That Mr. D. gave us no more *Pickwick Papers* is to be lamented, but may be easily explained by the fact, that he never had the advantage of being five-and-twenty again. Since then, however, he produced many works more admirable in other respects. *Nicholas Nickleby*, his next effort, was, as a story, greatly in advance of it. It was also the first of those social novels which form so marked a feature in modern literature. It was aimed at the wrongs and cruelties inflicted upon their wretched pupils by the cheap schoolmasters of Yorkshire—and it hit its mark. After this beginning, our author set lance in rest against many a social monster. He may be sometimes wrong, but he can scarcely be accused of want of honesty of purpose; while quite as little can partisanship (except that he is always for the poor) be laid to his charge, since at the very time that the country gentlemen were shaking their heads at him for his want of reverence for "land," he incensed the manufacturing interest by the publication of *Hard Times*. His sarcasm is of a rather peculiar character; too good-natured to sneer, and with eyes, notwithstanding their indignant fire, that never lose sight of the ludicrous side of things, his style is mocking argument. After *Nicholas Nickleby* came *Master Humphrey's Clock*, containing the *Old Curiosity Shop* and *Barnaby Rudge*. In the former of these, and in the character of Little Nelly, he first exhibited that power of setting forth child-life and child-thought which may have been said perhaps, before the publication of George Eliot's works, to be peculiarly his own. *Barnaby Rudge* was his first, and, with the exception of his subsequent *Tale of Two Cities*, his only attempt to describe the past; and it was a successful one. It is probably, with reference to plot and circumstance, his best novel, barring *David Copperfield*. The *Old Curiosity Shop* began in a curious dreamy manner, which, although obviously a favorite one with our author, he soon perceived was unappreciated, and had the prudence to discontinue. This disposition of his mind towards the weird and the grotesque he subsequently developed with greater success in his *Christmas Stories*. After a voyage across the Atlantic, Mr. D. published, in 1842, his *American Notes for General Circulation;* but a much more admirable result of that expedition appeared in his *Martin Chuzzlewit*. This was certainly the greatest of his humorous works since the *Pickwick Papers*, and it may almost be said to have been his last. From this period, his animal spirits—a rare gift among even comic authors, and rarely lasting so long as in his own case—appeared to have deserted him. His humor, except in some rich creations, such as Mr. Micawber, was no longer so apparent, while, on the other hand, his wit and pathos increased. *Dombey and Son* was considered a falling off in one who stood so high; but his death of little Dombey brought tears to the eyes of lawyers. When men were expecting that he should wane and weaken like other prolific writers before him, he produced a novel as fresh as the dawn. In this, he, for the first time, adopted the autobiographical form, and that perhaps offered him some advantages; but at all events, the result was admirable. *David Copperfield* is, in our judgment, by far his greatest work, and will endure—though for very different reasons—as long as the *Pickwick Papers*. Its Agnes is one of the most charming female characters in the whole range of fiction. *Bleak House*, *Hard Times*, *Little Dorrit*, the *Tale of Two Cities*, *Great Expectations*, and *Our Mutual Friend*, afterwards succeeded one another with almost periodical punctuality, and an audience larger than any English author ever had awaited each. We must also note *Oliver Twist*, one of his most popular works, the first installment of which appeared in 1837 in *Bentley's Miscellany*. No prose-writer was ever more quotable or more quoted than he. In 1845, the *Daily News* was started under Mr. D.'s editorial auspices, but the task appears to have been ungenial, for he soon withdrew from it. In 1850, he commenced a weekly periodical entitled *Household Words*, afterwards merged in *All the Year Round*. In 1867, he again visited America, giving numerous readings, and meeting with a brilliant reception. He was till the last engaged in writing a new novel, *The Mystery of Edwin Drood*, which was left unfinished. He died on June 9, 1870. His *Life* was written by John Forster (3 vols., 1871–74). See also the selection from his *Letters* (1879–81).

DICKENS, a co. in n.w. Texas; formed 1876, organized, 1891; 900 sq. m. Pop. '90, 295. Co. seat, Dickens.

DICKENSON, a co. in s. western Va., on the Kentucky border, drained by the west fork of Sandy river; pop. '90, 5077. Area, 375 sq. m. Co. seat, Clintwood.

DICKEY, a co. in s. eastern North Dakota, formed in 1881; 1152 sq. m.; pop. '90, 5573. It is drained by the James or Dakota river and other streams. Co. seat, Ellendale.

DICKINS, Asbury, 1780–1861; b. in N. C.; son of Rev. John Dickins. In 1801 he was associated with Joseph Dennie in the *Portfolio*, a weekly publication. He spent some years in Europe, and on return was given a place in the treasury department, and afterwards in the state department, where he was acting secretary. In 1836 he was chosen secretary of the United States senate, and filled the office 25 years.

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DICKINS, JOHN, 1747–98; a native of London, educated at Eton. He came to America before the revolution, and was one of the most zealous and efficient promoters of the Methodist Episcopal church in the country. He preached in Virginia and North Carolina, and in 1783 took charge of the John-street church in New York city. In 1789 he was stationed in Philadelphia, and there established the "Methodist Book Concern," afterwards removed to New York.

DICKINSON, a co. in n.w. Iowa, on the Minnesota border; 408 sq. m.; pop. '90, 4328. Spirit lake occupies a considerable part of its area. Co. seat, Spirit Lake.

DICKINSON, a co. in central Kansas, on the Kansas river, crossed by the Union Pacific and other railroads; 851 sq. m.; pop. '90, 22,473. Co. seat, Abilene.

DICKINSON, ANNA ELIZABETH, b. Philadelphia, 1842. Her father died when she was but two years old, and she received a rudimentary education in a Quaker school. When but 14, she wrote for the *Liberator* an article on "Slavery." At 17, she taught school in Bucks county. The next year she made her first speech at a meeting of Progressive Friends (Quakers) in Philadelphia, her subject being "Woman's Rights and Wrongs," and thenceforward she was a frequent speaker, chiefly on total abstinence and slavery. Near the close of 1861, she added politics, and strongly supported the war for the union. Subsequently she devoted her attention to lecturing and to the drama, writing *A Crown of Thorns*, and *True to Herself*, and acting in these plays with very moderate success, and in 1891 was placed in a retreat.

DICKINSON, DONALD MCDONALD, b. Port Ontario, N. Y., Jan. 17, 1846; graduated at the university of Michigan and was admitted to the bar in 1867; was employed in many cases of public interest; represented Michigan on the National Democratic committee for many years; was postmaster-general in 1888–9; chairman of the National Democratic campaign committee in 1892; and was appointed senior counsel for the United States before the Bering Sea claims commission in 1896.

DICKINSON, JOHN, LL.D., 1732–1808; b. Md., educated in London, a lawyer in Philadelphia; deputy to the first colonial congress, and a member of the continental congress of 1774, to which body he presented several important papers. He spoke against the declaration of independence, deeming it premature, and was one of the few members who did not sign that document. He was representative from Delaware in congress in 1779. In 1783 he founded Dickinson college, Carlisle, Penn., to which he gave a liberal endowment.

DICKINSON, JONATHAN, 1688–1747; b. Mass.; graduate of Yale. He was for 30 years a Presbyterian minister in Elizabethtown, N. J., and was in high repute in all the region. In 1746, he was elected president of the college of New Jersey. He wrote a number of theological works.

DICKINSON COLLEGE, at Carlisle, Pa., was established as a Presbyterian institution in 1783, but passed under Methodist control in 1833. It was named for John Dickinson, one of the principal founders. It has a productive endowment of about $300,000, and an annual income of about $40,000. The campus embraces nine acres with a beautiful growth of trees. Of the buildings, eleven in number, all are modern save two, erected in 1803 and 1833 respectively. The apparatus for illustration in scientific purposes is valuable. The astronomical observatory is provided with an achromatic telescope, there is a museum of natural history and geology and a library of 40,000 volumes. There are five courses of study, classical, Latin-scientific, Greek-scientific, scientific, and modern language. There is a preparatory school under the immediate control of the faculty. The school of law was founded in 1836. The number of professors in 1897 was 26 and of students 400. President, George E. Reed, S.T.D., LL.D.

DICKSON, a co. in n. Tennessee, on the Cumberland river and its affluents, intersected by the Nashville, Chattanooga, and St. Louis railroad; 620 sq. m.; pop. '90, 13,645, includes colored. It has a rolling surface and fertile soil. The Cumberland river is navigable for steamboats. The productions are corn, tobacco, etc. Co. seat, Charlotte.

DICKSON, SAMUEL HENRY, LL.D., 1798–1872; a physician, b. S. C.; graduate of Yale, 1814; studied medicine in the university of Pennsylvania. In 1824, he was appointed to the professorship of the institutes and practice of medicine in the medical college of Charleston. In 1847, he was professor of the practice of medicine in the university of New York. In 1858, he accepted a similar chair in the medical college in Philadelphia. He published many volumes and papers on medical subjects.

DICLINOUS (Gr. *dis*, twice, and *klinē*, a bed), a term in botany, signifying that flowers are unisexual, having stamens only, or pistils only, and opposed to *monoclinous* or *hermaphrodite*. It is much used by some botanical authors.

DICOTYLE'DONOUS PLANTS are those of which the embryo is ordinarily furnished with two seed-lobes or cotyledons opposite to one another, or with more than two, which in that case are verticillate. In general there are only two cotyledons; a greater number being of rare occurrence, but being found in some of the *coniferæ*, as spruce-fir, larch, etc., in *ceratophyllum*, etc. It is not, however, always quite easy to determine whether a plant belongs to the class of dicotyledonous plants or to that of monocotyledonous plants (q.v.), as sometimes, in the former, only a single cotyledon presents itself, which is the case with a number of species of the sub-genus *bulbocapnos* in the genus *corydalis*; or the cotyledons are altogether wanting, as in dodder (*cuscuta*), or the embryo is in so rudimentary a state in the seed, that it at first consists only

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of a pair of cells as in *monotropa*. The habit of the plants is therefore also to be taken into account, and particularly the structure of the stem and its mode of increase. The *radicle* of the embryo in dicotyledonous plants generally elongates itself by degrees until it forms the root of the plant itself; wherefore Richard designated these plants *exorhizæ* (Gr. *exo*, outward, and *rhiza*, a root). The stem is exogenous (q.v.), and usually branched. The leaves have branching veins, and exhibit great variety of form. They are articulated to the stem. The calyx and corolla, when both present, are usually more distinct and dissimilar than in monocotyledonous plants.

DICOTYLES. See PECCARY.

DI'CRANUM, a genus of mosses, having a single *peristome* of sixteen equidistant bifid teeth and the *calyptra* splitting up on one side (*dimidiate*). See MOSSES. The species are numerous, and some of them are among the most common British mosses, growing on the ground and on moist rocks. Many of them have elongated branching stems.

DICTA'TOR, in the earliest times, was the name of the highest magistrate of the Latin confederation, and in some of the Latin towns the title was continued long after these towns were subjected to the dominion of Rome. In the Roman republic the D. was an extraordinary magistrate, irresponsible and endowed with absolute authority, whose original name was *magister populi*. The frequency of *crises*, or critical periods, in the quick, aggressive growth of the Roman state, necessitated such an office. The first D. (T. Larcius or M. Valerius) was appointed 501 B.C., nine years after the expulsion of the Tarquins. According to Livy, the immediate cause of this dictatorship was a formidable war with the Latins. In general no one could be appointed D. who had not been previously consul, and this condition was very rarely dispensed with. Niebuhr is of opinion that the D. was originally created or elected by the curiæ, like the kings, but it is more probable that the senate passed a decree ordering one of the consuls to name or proclaim (*dicere*) a dictator. Originally, of course, the D. was a patrician; the first plebeian who filled the office being C. Marcius Rutilus, 356 B.C., who was nominated by the plebeian consul M. Popillius Lænas. The dictatorship could not *lawfully* be held longer then six months, nor was it ever so, except in the cases of Sulla and Cæsar, which were altogether peculiar. It must not be supposed that during a dictatorship the functions of the other magistrates were positively suspended. The consuls and other regular authorities continued to discharge their proper duties, but in subordination to the direction and command of the D.; being for the time simply his officers. The superiority of his power, when compared with that of the consuls, appears chiefly in these three points: he was far more independent of the senate; he had a more extensive power of punishment, without any appeal; and he could not be called to account after his abdication of the dictatorship for anything he had done during the period of his office. The *limits* of his power were as follows: he could not touch the treasury; he could not leave Italy; and he could not ride through Rome on horseback without previously obtaining the permission of the people. While the consuls had only 12 lictors, the D. was preceded by 24, bearing the *secures* and *fasces*. To him also belonged the *sella curulis* and the *toga prætexta*. The last legally elected D. was M. Junius Pera, who entered on his office 216 B.C. From this time *nominal* dictators were frequently appointed for the purpose of holding the elections, but even these finally disappeared, 202 B.C. Henceforth, in critical times, a sort of dictatorial power was conferred on the consuls by the senate by the well-known formula: "That the consuls should see to it, that the state should receive no damage." This practice rendered the appointment of *dictators* no longer necessary.

DICTIONARY, is merely the English form of *dictionarium*, a word not to be found in classical Latin, though of frequent use in that called monkish or mediæval. A D. is, as every one knows, a book, but, in the widest sense of the word, its contents admit of no more strict definition than that they are arranged according to the order of the alphabet, and that every word within the scope professed to be embraced by the D. must have its proper place accordingly. It may be further said that the D., in order to distinguish it from a mere list or index, must contain explanations or information about each word thus included within its scope, except in cases, of which many examples may be found in the present work, where it is sufficient to refer for a part or the whole of the account of one word to what is said under some other word. There are several other terms that are used synonymously, or nearly so, with dictionary. The Greek word lexicon is in common use for a D. of languages. It is not entirely so limited, however, in practice, as may be seen in such works as the *Lexicon Juridicum* of Calvinus or Kahl, which is just a D. of Roman and feudal law, of the same kind as sir Edward Tomlin's *Law Dictionary* is of English law. The word encyclopædia has generally a wider meaning; but there are often several books exactly of the same kind, of which some are called dictionaries, and others encyclopædias. Glossary and vocabulary are nearly synonymous with a D. of a language; and the words thesaurus, catalogue, directory, gazetteer, and index, are sometimes used as a title when D. might be not inapplicable.

Dictionaries may be divided into two classes—(1) dictionaries whose object is to explain words and phrases; and (2) those that aim at giving information about things.

1. Dictionaries of language are, again, divided into various sub-classes or species. The most common kind—what, indeed, is understood by the term D. (and the equiva-

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lent Greek term *lexicon*) when used by itself—is an alphabetical list of the words composing any language, either explained in the same language, or interpreted by the corresponding words of one or more other languages. To indicate that all, or nearly all, the words of the language are embraced, the name *thesaurus* (treasury) is sometimes used. *Special* dictionaries contain only the words used by single authors, or classes of authors. A *glossary* is a D. of unusual terms. An *etymological* D. is one in which the derivation of words is the sole or a prominent object.

2. Dictionaries of things (Ger. *realwörterbücher*), or of information, are also of various kinds. When the whole field of human knowledge is embraced, we have an alphabetical encyclopædia. The name encyclopædia or cyclopædia is sometimes given to dictionaries of special departments of knowledge, as the *Cyclopædia of Anatomy and Physiology;* but in all such cases, D. seems the correcter term. See ENCYCLOPÆDIA.

There is no kind of information, within wide or narrow bounds, that may not be thrown into the D. form. Dictionaries of apt quotations from the classics, the Scriptures, or the fathers, were much in vogue in the 17th century. There are dictionaries of biography, of geography, of dates, of architecture, of cookery, of political economy, of fortification—in fact, of every object of human knowledge and practice. As dictionaries of this class are of the same nature, except as to the restriction of their field, as encyclopædias properly so called, we reserve some notice of the more important of them for that head.

Dictionaries of language, in our sense of the word, are of modern origin. The Greeks and Romans had no idea of a book embracing all the words of their own or any foreign tongue. Glossaries, however, of unusual words and phrases were early current. The earliest work of the kind extant (though much interpolated) is the Homeric lexicon (Gr. *Lexeis Homerikai*, "Homeric words") of Apollonius, an Alexandrine grammarian of the time of Augustus. More extensive compilations, such as the lexicon of Suidas (q.v.), and the *Etymologicum Magnum* (q.v.), were made in the middle ages. A real D. became first possible after the invention of printing. A broad and sure basis for Greek lexicography was laid by Henry Stephens (q.v.) in his *Thesaurus* (1572); the Latin *Thesaurus* of Robert Stephens, which did the same for Latin, had appeared in 1531. Previously to the discovery of printing, and for some time after, the explanations of Latin words were given in Latin. "The earliest *printed* vocabulary with which we are acquainted in which the words of any modern language answering to the Latin are inserted, is the *Promptorius Puerorum*, published by Pynson in 1499, in which English words are followed by their supposed Latin equivalents" (*Quarterly Review*, Sept., 1855).

The latest standard dictionaries of the principal languages are the following: *Sanskrit*, the "Petersburg Lexicon" (Sanskrit and German), by Böhtlingk and Roth, 7 vols., St. Petersburg (1853–1875); *Greek*, Liddell and Scott's Lexicon, Oxford (1883); *Latin*, Lewis and Short's Lexicon, New York (1879); *Mediæval Latin*, Du Cange's Lexicon, latest edition, Paris (1865); *French*, Littré's, 4 vols., Paris (1882); *German*, Grimm's, 7 vols., Leipzig (1889); *Swedish*, Soren and Janzow's, Stockholm (1886); *Danish*, Aucker's, Copenhagen (1874); *Dutch*, Calisch's, Tiel (1871–); *Russian*, Dahl's, Moscow (1873–); *Italian*, Tommaseo and Bellini's, Turin (1868); *Spanish*, Campano's, Paris (1876); *Portuguese*, Marquis, Lisbon (1875) and Souza Pinto's, Paris (1877); *Romance Languages*, Diez, tr. by Donkin, London (1864); *Arabic*, Lane's, London (1874–); *Hebrew*, Fuerst's, 2 vols., Leipzig (1876); *Turkish*, Redhouse, London (1860); *Modern Greek*, Sophocles, Cambridge, Mass. (1860); *English*, Worcester's, last ed. (1874); Webster's, last ed. (1890); the *Century Dictionary*, ed. by Prof. W. D. Whitney, N. Y., 6 vols., A–Z. (1891); and the *Standard Dictionary*, ed. by Dr. Isaac K. Funk (1894). The greatest dictionary of any language, when completed, will be the English Dictionary of the English Philological Society, edited by Dr. J. A. H. Murray, of which in Feb., 1891, the first volume (A–B) and a part of the second volume had appeared. The best etymological dictionary of English is that of W. W. Skeat, Oxford (1882). Special lexicons of other languages not mentioned in this list will be found under their respective titles. See Williams, *Our Dictionaries* (N. Y., 1890).

DICTY'OGENS, in botany, a class established by Lindley for the reception of a comparatively small number of natural orders, genera, and species, usually included by other botanists among *endogens* or endogenous plants (q.v.), but which, whilst they agree with endogens in the structure of the embryo, differ from them in the stem and leaves.

DICTYS OF CRETE, one of the early historians from whom certain Roman writers imagined that Homer derived material for the *Iliad* and the *Odyssey*. According to an introduction prefixed by an unknown writer to the Latin translation entitled *Dictys Cretensis de Bello Trojano*, the author followed Idomeneus, king of Crete, in the Trojan war; the manuscript of his work, written in Phenician characters, was found in his tomb at Gnossus at the time of an earthquake in the 18th year of Nero's reign, and translated into Greek by Nero's order. A Latin version of the first five books is all that has come down to us; but this is generally regarded as a forgery. The main interest of the work consists in the fact that, with the work of Dares, it was the medium through which Homeric legends were introduced into the literature of the middle ages.

DICY'NODON, the name given by Owen to a genus of fossil reptiles, whose remains have been found in South Africa. The true age of the rock in which they occur has not been ascertained; the accompanying organisms seem to indicate that it is triassic. Few bones of these animals, save those of the skull, have been sent to this country. A

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complete restoration of one would be a most valuable addition, not only to paleontology, but to systematic zoology as well; for the numerous skulls that have been examined, have been sufficient to show that this is one of those anomalous forms which unite in their structure the characteristics of widely different animals. It has affinities with the crocodile, the lizard, and the tortoise, though perhaps the completely closed orbits and the sharp compressed jaws ally it more closely to the last-named animal. Its lower jaw also is covered with a horny plate, as in the tortoise. The most remarkable peculiarity is the existence of a pair of large sharp-pointed tusks, one from each side of the upper jaw, growing downwards as in the mammalian morse or walrus. The generic name, meaning "two canine teeth," has been given to them from these singular tusks, which are peculiar to this genus The articulating surfaces of the vertebræ are both hollow—a fish-like peculiarity, from which it might be argued that these reptiles were good swimmers; probably they lived constantly in the water, but the construction of the bony passages of the nostrils proves that they must have come to the surface to breathe air. Four species have been discovered.

DIDAC'TIC POETRY, that kind of poetry which aims, or seems to aim, at instruction as its object, making pleasure entirely subservient to this. It has been disputed whether or not the existence of a kind of poetry especially entitled to the name didactic, consists with the very nature and object of the poetic art. For it is held that, to point out instruction as the peculiar object of one kind of poetry, is to overlook the high aim of all poetry; and that a poem may be in the highest sense didactic, which yet is epic, dramatic, or lyric in its form; and the book of Job, the Psalms, and other poems contained in the Sacred Scriptures, are quoted as examples.

DIDACTICS. See EDUCATION; PEDAGOGY.

DIDEL'PHIS. See OPOSSUM.

DIDEROT, DENIS, a celebrated French encyclopedist and philosophical writer, was born at Langres, in Champagne, 5th Oct., 1713. He was educated for the church at the college of his native town, and subsequently at that of D'Harcourt, Paris; but disliking the clerical office, and after having made a trial of law, a profession which he also found uncongenial, he finally resolved, after various vicissitudes, upon becoming a *littérateur*. For some years, however, his mode of life was very precarious. On one occasion, being reduced to the greatest extremities, he seriously resolved that if the world should ever prosper with him, he, not ignorant of misfortune, would never disregard the applications of the indigent. This resolution was religiously kept; for after having attained a position of comparative affluence, he was continually surrounded by applicants desirous of obtaining assistance, which, whether in the shape of money or instruction, D. was always willing to afford them. Although very poor, D. married in 1743. Necessity now drove him to increased exertions. He translated the *History of Greece* from the English of Stanyan, receiving for this work the sum of 100 crowns. Soon afterwards followed the *Essai sur le Mérite et la Vertu;* the *Pensées Philisophiques*, written, it is said, in the space of four days; and the *Interprétation de la Nature*. Shortly after appeared his *Lettre sur les Aveugles*, for the writing of which he was confined three months in the prison of Vincennes. Believing that it was, among other things, his vocation to regenerate the theater, he produced a melodrama (1758), entitled *Le Père de Famille*. It was unsuccessful, and was followed by others equally so, so that it was said, "Le Père de Famille a été le père d'une famille déplorable."

But D.'s great work was the *Encyclopédie*, of which he and D'Alembert were the joint-editors It was commenced in 1749. D., besides revising all the articles, wrote the departments of history, of ancient philosophy, and of the mechanical arts. He also wrote art criticisms from 1765 to 1767, showing a readiness in interpreting the meaning of a picture, and a power in reproducing it vividly in words, unequaled by any writer of his time. Towards the latter portion of his life, D., who had never been able to save any money, determined to sell his library, to provide for his only daughter. The empress Catherine of Russia, having been informed by her French ambassador of his intention, bought the library, on condition that D. himself should be librarian, and undertake the care of it at a salary of 1000 francs yearly. In 1778, he set out for St. Petersburg to thank his imperial benefactress, returning in the following year. But his health, which was impaired by this journey, soon after gave way, and he died on the 30th July, 1784.

D. had worked at the encyclopædia for the space of about 30 years. His fitness, natural and acquired, for this species of literary labor was complete. With the advantage of an excellent education, he had a great love of truth, and a curiosity to ascertain the real relations of any subject upon which he was engaged. He was distinguished by a swiftness and dexterity of intellect, that enabled him to catch the salient points of his topic, and to present them in the best light. As regards religion, D. was an atheist, sincere even to fanaticism in his opinions, and anxious to indoctrinate his countrymen with his own skepticism. The *encyclopédie* became a vehicle for the indirect propagation of his views. One of the last recorded sayings of D. is very characteristic: "The first step towards philosophy is incredulity;" but, unfortunately, D. thought it was also the last. An edition, in 20 vols., of all D.'s works, by Assézat and Tourneux, was com-

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pleted in 1877. See John Morley's monograph on *Diderot and the Encyclopædists* (2 vols., 1878).

DIDIUS SALVIUS JULIANUS, MARCUS, for a brief period emperor of Rome, under the name of Marcus Didius Commodus Severus Julianus. He was quæstor, ædile, and prætor; commanded a legion in Germany, and was governor of Belgic Gaul, and afterwards of Dalmatia and lower Germany. He was consul and proconsul in Africa, and governor of Bithynia in Asia Minor. When Pertinax was assassinated, the throne was offered to the highest bidder by the prætorians, and Didius bought it, thus becoming emperor; but whenever he appeared in the streets he was greeted with the epithets of "robber" and "parricide." The legions abroad did not recognize him, and proclaimed Septimus Severus as the true emperor. Severus marched to Rome and was recognized by the senate. Didius was deserted, and after two months' reign was killed by a soldier.

DI'DO, or **ELIS'SA**, according to the legend, the foundress of Carthage, was the daughter of a king of Tyre, called by some Agenor or Belus, by others Mutgo or Matgenus. His successor, Pygmalion, the brother of D., murdered her husband and uncle, a priest of Hercules named Acerbas; by Virgil, Sichaeus. With the treasures of Sichaeus, which Pygmalion had sought for in vain, and accompanied by many Tyrians, D. escaped to sea. She landed in Africa, not far from the Phœnician colony of Utica, and built a citadel called Byrsa (from Gr. *Bursa*, the hide of a bull), on a piece of ground which she had bought from the Numidian king Hiarbas. The meaning of the word Byrsa, gave rise to the legend that D. purchased as much land as could be encompassed with a bullock's hide. After the agreement she cut the hide into small thongs, and thus inclosed a large piece of territory. Here she built the city of Carthage. To avoid being compelled to marry Hiarbas, she stabbed herself on a funeral pile, which she had caused to be erected, and after her death was honored as a deity by her subjects. Virgil ascribes the death of D. to her unrequited passion for Aeneas; but many of the ancient writers conceived that the poet had committed an anachronism in making her contemporary with the Trojan prince. The more general opinion was, that D. had built Carthage somewhere between 50 and 100 years before the foundation of Rome.

DIDOT, the name of a celebrated family of French printers and publishers.

D., FRANÇOIS, the first of the family that attained eminence, was b. in 1689, and d in 1757. His principal professional achievement was the publication of the *Voyages* of his friend the abbé Prévost, a work in 20 volumes, perfect as regards the text, and enriched with a great number of engravings and geographical maps. D. had eleven children, of whom two—FRANÇOIS AMBROISE D. (b. 1730, d. 1804) and PIERRE FRANÇOIS D. (b. 1732, d. 1795)—acquired considerable distinction as printers. HENRI D. (b. 1765, d. 1852), eldest son of Pierre François, made himself famous as an engraver, letter-founder, and mechanician. He was 66 years old when he engraved, for his well-known "microscopic" editions of eminent authors, those characters which are the *ne plus ultra* of typographical art. A daughter of the third son of Pierre François married Bernardin de Saint-Pierre, who was for some time associated with the Didots in their paper manufactory of Essonne; and in his country-house near this place wrote his *Paul et Virginie*. PIERRE D., eldest son of François Ambroise (b. 1760, d. 1853), still further increased the fame of the family. His Louvre editions of *Virgil*, *Horace*, *Racine*, and *La Fontaine* are magnificent. At the exhibition of the products of industry in 1801, a jury declared his *Racine* to be "la plus parfaite production typographique de tous les âges." Besides a great number of works, not less remarkable for their typographical perfection than for their literary value, such as the *Voyages de Denon*, D. published a collection of the French *chefs-d'œuvre*, dedicated *Aux amis de l'Art Typographique*. D. was also an able *littérateur*.

D., FIRMIN, brother of the preceding, and son of François Ambroise D., was b. at Paris in 1764. As a printer, and especially as an engraver and founder, he raised the family name to the pinnacle of professional eminence. The absolutely perfect Roman characters used in the Louvre editions printed by his elder brother, were engraved and cast by him. Firmin D. applied the stereotyping process to the Logarithmic Tables of Callet, a work that required to be executed with the most rigorous accuracy, and which, through this means, is perfectly free from error or blemish. The whole of the French, as well as most of the Italian and English classics, were published by him according to the same process. These stereotypic editions (the word *stereotypic* was invented by Firmin D.) were wonderfully correct and cheap; *Virgil* is without a blemish, is ornamented with vignettes, and was sold for 15 sous (15*c.*); it was a kind of revolution in the book-trade of France. The most distinguished foreigners were accustomed to visit D.'s establishment as one of the great sights of Paris. The emperor Alexander, when in Paris in 1814, minutely examined every department of it; and placed under D. two young Russians, to be instructed in all the branches of typography. Some of the most celebrated continental printers served their apprenticeship with him. In 1827, Firmin D. retired from business, to devote himself wholly to his duties as *député*. A sage friend of freedom, he attached himself to the moderate and constitutional opposition, headed by Royer Collard. D. also obtained considerable reputation as an author by his tragedies, *La Reine de Portugal* and *La Mort d'Annibal*, and several volumes of metrical translations from the classics. He died 24th April, 1836.

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D., Ambroise Firmin, and Hyacinthe, sons of the preceding, b. 20th Dec., 1790, and 11th Mar., 1794, long carried on the family business (aided by their sons, Alfred and Paul D.), under the firm of Firmin Didot frères. Ambroise died in 1876; Hyacinthe, in 1880; but in the hands of the survivors, the business is still carried on.

DIDRON, Adolphe Napoléon, 1806–67; a French archæologist. By the advice of Victor Hugo he turned his attention to Christian archæology, and examined nearly all the old church edifices of France. In 1839, he went to Greece to study the eastern churches. In 1844, he started a periodical, *Annals of Archæology*, devoted to his favorite subject, and was the editor until his death. In 1845, he established in Paris a special archæological library, and at the same time a manufactory of painted glass. In the same year he became a member of the legion of honor. His most important work is *Christian Iconography*.

DIDY'MIUM is a very rare metal found in the minerals cerite, allanite, etc.

DID'YMUS, of Alexandria, 309–394; an ecclesiastical writer. Although he became blind at the age of four, before he had learned to read, he succeeded in mastering all the sciences then known, and on entering the church was placed at the head of the Alexandrian school of theology. Most of his works are lost, but we possess a translation by Jerome (one of his pupils) of his treatise on the Holy Ghost, and a translation by Epiphanius of his comments on the canonical epistles. A treatise against the Manichæans in Greek is also extant.

DIÉ, St., a t. of France, in the department of Vosges, is situated on the Meurthe, 25 m. n.e. of Epinal. It is handsomely built; its streets clean and regular. D. is also the seat of a bishop, has an old cathedral church, and various important educational institutions. It has manufactures of cotton goods, with some trade in corn, cattle, flax, hemp, paper, ironmongery, etc. There are copper and iron mines, ironworks, and marble quarries in the neighborhood. Pop. 13,000.

DIE'BITSCH-SABALKANSKI, Hans Karl Friedrich Anton, Count, 1785–1831; Count von Diebitsch and Narden, a Russian field-marshal, native of Silesia. At the age of 12 he entered the Prussian army, but left it four years later for the Russian service. He was wounded at Austerlitz, fought at Eylau and Friedland, being promoted to captain after the Friedland conflict. In 1812, he distinguished himself by the re-capture of Polozk, and by a defense which saved Witgenstein's corps, which was then in retreat. He was made maj.gen., and with Gen. Yorck took possession of Berlin. After the battle of Lutzen he was sent to Silesia, and had a share in negotiating the secret treaty of Reichenbach. After the battle of Leipsic, he was made lieut.gen. In 1814, he urged the march of the allies on Paris, for which the emperor conferred on him the order of St. Alexander Newski. In 1815, he married, attended the congress of Vienna, and was made adjt.gen. to the emperor. He was present at Alexander's death at Taganrog. The emperor Nicholas made him baron and count. In the Turkish war, 1828, he had the chief command, took Varna, crossed the Balkans, and made peace at Adrianople. The crossing of the Balkan mountains was commemorated in the addition of *Sabalkanski* to his name, and his elevation to the rank of field-marshal. On the outbreak in Poland in 1830, he was given the chief command. He died of cholera in 1831.

DIE'DENHOFEN, called by the French Thionville, a t. in Germany on the Moselle, and the railroad from Metz to Luxemburg, 15 m. n. of Metz; population, 7155. It has a botanic garden, a gymnasium, and many manufactories. The Carlovingian rulers sometimes resided here. Subsequently it belonged successively to Luxemburg, Burgundy, Austria, and Spain. In 1643, it was annexed to France. In 1870, it was taken by the Germans, and by the treaty of 1871 was annexed to Germany.

DIEFENBACH, Lorenz, a great philologist, was born at Ostheim, in the grand-duchy of Hesse, 29th July, 1806, studied theology and philosophy at Giessen, traveled much, and was twelve years pastor and librarian at Solms-Laubach. In 1848 he settled at Frankfort-on-Main, where in 1865 he was appointed second librarian to the city. Here he died, 28th March, 1883. His literary industry was enormous, embracing poetry and romances, as well as those more ponderous works by which his name will live. His greatest books—monuments of sagacity and learning—are, *Celtica* (3 vols., 1839–40); *Vergleichendes Wörterbuch der Gotischen Sprache* (2 vols., 1846–51); *Glossarium Latino-Germanicum mediæ et infimæ ætatis*, a supplement to Ducange's well-known Glossary (1857); *Origines Europææ; Hoch-und Niederdeutsches Wörterbuch* (with Wülcker, 2 vols., 1874–85).

DIEFFENBACH, Joh. Fried., a celebrated surgeon of recent times, was b. in Königsberg in Prussia, in 1794. He had begun the study of theology when the war of liberation broke out, in which he took part as a volunteer. In 1816, he exchanged the study of theology for that of medicine, and especially surgery. After studying at Bonn and elsewhere, and traveling in France, he took his degree in 1822, and commenced practice in Berlin, where he soon attained distinction as an operator, and in 1840 was promoted to be professor and director of clinical surgery. He died in 1847. Besides eminent skill in all the usual operations with the knife, D. introduced many improvements, particularly in the art of forming new noses, lips, eyelids, and the like, as well as in cutting the muscles for squinting and stammering. Of his writings, we may mention *Die Transfusion des Bluts und die Einspritzung der Arzneien in die Adern* (Berl.

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1828); *Ueber die Durchschneidung der Sehnen und Muskeln* (Berl. 1841); *Die Heilung des Stotterns* (Berl. 1841); *Die Operative Chirurgie* (12 vols., Leip. 1844–48), his chief work, which has been translated into several languages.

DIELYTRA, a genus of plants of the natural order *fumariaceæ*, in appearance and habit much resembling fumitories of extraordinary size. *D. spectabilis*, a native of Siberia and the northern provinces of China, was introduced into Britain from the island of Chusan in 1846, and rapidly became a general favorite, on account of its long racemes of drooping, delicate, rosy-pink flowers. It is now to be seen not only in greenhouses, but, as commonly as almost any flower, in cottage-windows, and even in cottage-gardens, although in the northern parts of Britain it seldom attains its full luxuriance in the open air. It is one of the favorite plants of the Chinese.

DIEPENBECK, ABRAHAM VAN, a distinguished Flemish painter, was b. probably in 1607, at Hertogenbosch (Bois-le-Duc), and at first confined himself to painting on glass, in which he acquired the reputation of being the first of his time; but having conceived a disgust for this kind of painting, on account of the cracking of the glass, which he could in no way prevent, he abandoned it, and became a pupil of Rubens. He then went to Rome, and on his return to Belgium became a sort of assistant to his master. In 1641, he was elected president of the Antwerp academy, an honor which he retained till his death, in 1675. D. painted much, and with wonderful facility, on tapestry and wainscoting. He certainly imitated Rubens, but with great freedom and force of coloring. His works consist, for the most part, of designs for title-pages, theses, devotional subjects, and the decoration of books. They exhibit great fertility and liveliness of genius, but are in general hurriedly and imperfectly finished. His masterpiece in this way is the *Tableaux du Temple des Muses* (Paris, 1655), a series of designs, 59 in number, engraved by the best artists of the time—Bloemart, Maltram, etc. Those of Bellerophon, Orpheus, the Dioscuri, Leander, etc., have been pronounced unsurpassed. His oil-paintings on canvas are few, but the churches of Antwerp have many windows painted by him. D. resided in England for some time during the reign of Charles I., and painted several landscapes and animals for William Cavendish, duke of Newcastle.

DIEPPE, a seaport t. of France, in the department of Seine-Inférieure, at the mouth of the river Arques, on the English channel, lat. 49° 55′, long. 1° 5′ e. D. is situated between two high ranges of chalk cliffs, is regularly built, with tolerably wide, clean streets running parallel to the sea; and the houses—built for the most part of stone and brick, with high slanting roofs—have a picturesque appearance. It is walled, has a castle occupying a high cliff at the w. end of the town, which it commands, as well as the harbor, which is situated to the n.e., and admits vessels of 500 tons burden. West of the old castle lies the little fishing suburb of Pollet, far from beautiful in appearance, but exceedingly interesting from the fact that the inhabitants differ in language, manners, and costume from the rest of Upper Normandy, and are supposed to be descendants of those Saxons who settled on the French coast during the period of the Merovingian kings. Some interesting historical associations attach to the castle of Dieppe. Here Henry IV.—the people of D. having been the first to acknowledge his right to the throne of France—retired before the forces of the league, previous to the decisive battle of Arques, fought within 4 m. of D.; and here the duchess of Longueville, so noted as a leader of the party of the Fronde, sought refuge for a time from the royal power she had defied. The castle is now occupied as a barrack. The other principal buildings are the churches of St. Jacques and St. Remi, the theater, and a bathing establishment. The town has several squares, and is adorned by nearly 70 fountains, which derive their supply of water from an aqueduct about 3 m. long. D., being one of the principal watering-places of France, has a great accession of visitors during the summer months; and a large number of huts for the accommodation of bathers, bathing-machines being dispensed with, line the shores. The manufactures are lace, fine linen, and paper; and the carved articles of horn, bone, and ivory have long been famous. There are also ship-building yards, sugar-refineries, rope-walks, and distilleries; and the fisheries—both coast and Newfoundland—are important, almost the whole of the population of the suburb of Pollet being engaged in them. D. is a favorite landing-place of English tourists visiting France. Pop. '91, 22,359. The rise of Havre has greatly injured the trade of Dieppe.

DIE'-SINKING, the art of engraving the die or stamp used for striking the impression on coins, etc., and for stamping thin plates of metal into various devices.

The importance of die-sinking has much increased of late on account of the great extension of the process of stamping thin metal. Many kinds of work formerly bent into shape by the hammer and punch, are now struck by a few blows between suitable dies. As examples of these, we may mention the ornamental work of gas-fittings, window-curtain cornices, common jewelry, ornamental trays, dishes, boxes, etc. For such purposes, a pair of dies is required, one in relief, the other in intaglio, and the metal is pressed between them. Not only are ornamental articles stamped in this manner, but useful articles, composed of many parts, are made entirely by cutters and dies, each part being cut and stamped by a pair of dies, and then the parts united by another pair, the junction being effected by overlaps, which the uniting dies press into their places. See BUTTON. The astonishing cheapness of many of the sheet metal products is mainly due to the use of dies for doing by a single blow the work that

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formerly required long and tedious manipulation. For further information on this, see STAMPING.

The process of coining as applied to the manufacture of medals and metallic money is the same in general principles as drop forging work, but is carried out very differently in detail. Two coining dies are used in all of the mints of the principal nations of the world, an upper die and a lower die, which come together inside of a heavy steel collar into which the dies fit accurately. From a strip of metal of the required thickness a blank is punched out by an ordinary cutting die, and its edges are then rolled in a special machine which subjects the blank to radial compression. This operation is called the "milling process" and it thickens the edges of the blank and rounds off the sharp edges. The blank, after undergoing the milling process is called a planchet, and is then ready to be stamped in the coining press. The planchet is placed upon the lower die surrounded by the collar and the upper dye is brought down upon it, spreading the metal so as to fill out the cameo impressions on both faces of the coin. The upper die is then lifted and the collar is pushed down around the lower die to eject the coin. In some cases the coins or medals are reeded upon the edge, as is the case with the American silver and gold coins. This consists of a number of fine teeth running parallel with the axis of the coin, and is formed by fluting the internal surface of the collar. The collar is made very slightly conical to facilitate the removal of the coin. In case there should be a surplus of metal in the slightest degree, it is evident that in this work, as well as in drop forging, there will be fins about the edge at the only available place for the metal to escape, which is in the joints between the dies and the collar. To avoid this, great care is taken to have the weight and the mass of the metal in the planchets uniform to within a very slight limit of error. Further, to avoid fins the edges are left rounded as much as possible, which can be done only by not pressing the planchet hard enough in the middle to make the edge flow out violently and fill the interstices of the mold. Within the past few years since the production of aluminium has been so greatly cheapened, this metal has been used for stamping medals with excessively deep cameo effects. In this case it has been found necessary to make the planchet thinner around the edges on account of the excessive flow of metal from the center of the medal outwards. An impression in high relief or deep intaglio may be obtained by a single blow by the *cliché* method. For this a fusible alloy is used, such as type-metal, or still better, an alloy of 2 parts bismuth, 1 lead, and 1 tin, which fuses at about 212°, and becomes pasty before solidifying. The metal is poured into a box or tray a little larger than the die, and when in a pasty condition, the die is placed over it, and struck smartly with a heavy mallet or a coining press. A steel die is by no means necessary for this; sharp impressions may be obtained from bronze medals themselves, or even from wood and plaster casts. A cliché mold may be made in the first instance from the medal, and then a cliché relief from this mold, if the process is skillfully conducted. The skill required consists mainly in striking the blow with a force proportionate to the depth of the impression and the softness of the metal, and in selecting the right moment for doing so, just as the fused metal is on the point of solidifying; for, if too fluid, it will merely be driven aside; and if at all set, an imperfect impression results. The metal should be of about the consistence of melted sealing-wax, and then the surface is set by contact with the cool die or medal, while the body of the metal still yields to the pressure. Cliché molds are admirably adapted for electro-depositing.

DIES IRÆ, the name generally given (from the opening words) to the famous mediæval hymn on the last judgment. On account of the solemn grandeur of the ideas which it brings before the mind, as well as the deep and trembling emotions it is fitted to exite, it soon found its way into the liturgy of the church. The authorship of the hymn has been ascribed to Gregory the Great, St. Bernard of Clairvaux, Umbertus, and Frangipani, the last two of whom were noted as church-hymnists; but in all probability it proceeded from the pen of the Franciscan, Thomas of Celano, a native of the Abruzzi, in the kingdom of Naples, who died about the year 1255. When the church adopted it, and made it a portion of the service of the mass, cannot be ascertained with any exactness, but it must have been in any case before 1385. Several alterations were then made in the text; that, however, is believed to be the original which is engraved on a marble tablet in the church of St. Francis at Mantua. Germany has produced many translations of the hymn, such as those of Schlegel, Fichte, and Bunsen. It was translated into English by Richard Crashaw in the 17th c., and by Lord Macaulay, Lord Lindsay, the Rev. Isaac Williams of Oxford, and others in our own day. Sir Walter Scott has introduced two or three of the opening verses into his *Lay of the Last Minstrel*. The following are the most effective stanzas of the original Latin:

Dies iræ, dies illa
Solvet sæclum in favilla,
Teste David cum Sibylla.

Tuba mirum spargens sonum
Per sepulchra regionum
Coget omnes ante thronum.

Mors stupebit et natura,
Quum resurget creatura
Judicanti responsura.

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Liber scriptus proferetur,
In quo totum continetur
Unde mundus judicetur.

Judex ergo cum sedebit,
Quidquid latet apparebit,
Nil inultum remanebit.

Quid sum miser tunc dicturus,
Quem patronum rogaturus,
Quum vix justus sit securus?

Rex tremendæ majestatis,
Qui salvandos salvas gratis,
Salva me, fons pietatis.

Recordare, Jesu pie,
Quod sum causa tuæ viæ:
Ne me perdas illa die.

Quærens me sedisti lassus,
Redemisti cruce passus,
Tantus labor non sit cassus.

Qui Mariam absolvisti
Et latronem exaudisti,
Mihi quoque spem dedisti.

Inter oves locum præsta,
Et ab hœdis me sequestra,
Statuens in parte dextra.
Amen.

DIESKAU, LUDWIG AUGUST VON, 1701–67; a German soldier who served in the French army, adjutant to marshal Saxe, whom he accompanied in the campaigns in the Netherlands, becoming brig.gen. in 1748. He was sent to Canada in 1755, to command the French troops. With a force of 200 regulars, 600 Canadians, and 600 Indians, he moved up lake Champlain to attack fort Edward. When within 2 m. of the fort he first apprised his troops of his intention, but the Canadians and Indians, fearing the English cannon, declined. But on Sept. 8, 1755, the attack was made. The French marched along the road directly upon the English center, halting 150 yards from the breastworks. The French regulars made the central attack, while the Indians and Canadians dispersed on the English flanks. As soon as the English artillery began to play the Canadians fled to the swamps, and Dieskau was compelled to order a retreat, which was in fact a rout. The baron, who had received a wound in the leg, was found leaning against a stump, entirely alone. While feeling for his watch, an English soldier, suspecting him to be reaching for a pistol, fired into his hip, and he was taken to the fort a prisoner. He was liberated in 1763, and returned to Paris, where he died.

DIES NON. A Latin abbreviation for *dies non juridici*, meaning a non-judicial day, that is, a day on which the courts do not transact any business, as Sunday. In English law a number of church festivals are specified as non-judicial days. The entry of judgment upon a *dies non* is void.

DIESSEN, or BAYERDIESSEN, a market town and summer resort in Bavaria. It is on the s.w. end of Ammersee, and contains the extensive buildings of an old monastery.

DIEST, a t. of Belgium, in the province of Brabant, on the river Demer, 18 m. n.e. of Louvain. It is a walled town, and has strong fortifications. D., which was once a feudal barony, under the dominion of the princes of Orange, was taken by Marlborough in 1705. Pop. '90, 8531.

DIESTERWEG, FRIEDRICH ADOLF WILHELM, 1790–1866; a German teacher educated at Tübingen. In 1832, he was made director of the seminary for teachers of the Berlin city schools, which charge he held till 1850. He wrote many text-books on mathematics, geography, etc., and manuals for teachers, all of which have wide popularity. He was an advocate of the theories of Rousseau, Pestalozzi, and modern liberalism in general.

DI'ET. Man and animals generally require that their food should be of such a nature as to compensate for the wear and tear of the tissues which is perpetually going on, and as at the same time to keep up the animal heat at its proper standard. Various classifications of the food of man have been at different times proposed, but those which have been most generally accepted are that of Dr. Prout—in which the different kinds of food are grouped in definite chemical classes—and that of Liebig, which has reference solely to the ultimate destination of the food in the animal economy.

Dr. Prout classifies all kinds of food under these heads: 1. The *aqueous;* 2. The *saccharine;* 3. The *oily* or *oleaginous;* and 4. The *albuminous;* to complete which, we ought to add 5. The *gelatinous*, and 6. The *saline*—whilst Liebig makes only two classes: 1. Those consisting of nitrogenized matters, which are adapted for the formation of blood, and which he terms the *plastic elements of nutrition;* and 2. The non-nitrogenized substances, which from their large amount of carbon, serve (as fuel) to keep up the animal heat, and which he names the *elements of respiration.* Recent investigations, however, throw doubt on Liebig's view, that before food can be made available for the performance of work, it must first be turned into muscular tissue and then oxidized. Now it

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seems most probable that it is the oxidation of the non-nitrogenous substances, and not of muscle, that contributes chiefly to the production of muscular force. Starch, fat, and the other non-nitrogenous substances would therefore have to be regarded as force-producers, and not, as formerly, mere heat-givers. We shall therefore adopt Prout's classification. It was based on the consideration, that the milk (the only *single* article of natural food that serves to support the animal body) is made up of substances which may be taken as representatives of his groups; for this, our earliest natural diet, contains water, sugar (representing his saccharine group), butter (representing his oleaginous group), caseine (a nitrogenous matter very similar to albumen, and representing his albuminous group), and salts; and recent researches have shown that the yolk of the egg, which serves for the nourishment of the chick or other young animal before birth, similarly contains one or more representatives of the aqueous, saccharine, oleaginous, albuminous, and saline groups.

We shall now briefly consider these individual groups, and the uses to which the substances included in them are applied in the animal economy.

1. The *aqueous* group includes water and all the fluids which we use as drinks; and we must additionally bear in mind that all the varieties of animal and vegetable food which we term solids, in reality contain it, generally in great abundance; thus, for example, uncooked beef contains from 70 to 80 per cent, and some vegetables even a larger proportion of water. The uses of water are sufficiently obvious from the abundance in which it occurs in all the most important fluids of the body, as the blood, and the various digestive fluids. See DIGESTION, ORGANS AND PROCESS OF.

2. The *saccharine* group includes the different varieties of sugar, starch, gum, and cellulose, together with vinegar. This group is chemically characterized by all its members being included in the formula $C_aH_bO_b$; that is to say, they consist of carbon, together with hydrogen and oxygen in the proportions in which these elements form water. Hence (excepting vinegar) these substances have received the name of carbo-hydrates.

Of the sugars, grape-sugar or glycose is the most important, partly from its frequent occurrence in ordinary articles of food, such as fruits of most kinds, honey, etc., and partly because it is the form of sugar into which starch (a most abundant ingredient in most kinds of vegetable food) is converted by the saliva, and pancreatic and intestinal juices, before it is fitted for absorption or any further changes. Since the sugars (which may thus be regarded as including starch) do not, in the normal condition, pass into the excretions, but are oxidized in the blood into carbonic acid and water, as ultimate products, they must contribute materially to the support of the animal heat. But they have other uses which we shall endeavor to explain, and which will, we trust, be intelligible if this article is read in conjunction with that on DIGESTION, to which we have already referred. Before becoming oxidized into their final products, they undergo various phases of less perfect oxidation, in which lactic, acetic, butyric, and other acids are evolved, of which the most important and abundant is lactic acid, which is found in considerable quantity in the small intestine, where it is doubtless of service in contributing to dissolve any nitrogenous matters which have escaped the action of the gastric-juice. Another use of these acids which are developed from the sugars is, that by acidifying the albuminous intestinal contents, they greatly increase their diffusibility through the intestinal membranes into the lacteals, and probably the capillaries. Here we probably have the clew to the therapeutic use of acids in various disorders of the chylopoietic viscera. Under certain conditions, the sugars are also converted into fat in the body.*

The remaining carbo-hydrates are of little or no value as food. There has been much difference of opinion as to whether gum can be taken up and applied to any definite uses in the organism; but the great mass of the most trustworthy observations seem to show that it passes through the system unchanged. Independently of experiments on animals by Boussingault, Lehmann, and others, Dr. Hammond (an American chemist and physician) found from experiments upon himself (1) that gum is altogether incapable of assimilation, and therefore possesses no calorifacient or nutritive power whatever, but is, on the contrary, a source of irritation to the digestive organs; and (2) that in consequence of the above fact, the solids of the urine during a purely gum-and-water diet are entirely derived from the waste of the tissues of the body, while the carbon exhaled (as carbonic acid) from the lungs is derived from the consumption of the fat.

Cellulose, or the substance of the vegetable cell, resists the action of the digestive fluids, and reappears unchanged in the fæces.

Vinegar is probably only of use indirectly in softening animal textures which are taken as food.

3. The *oleaginous* group includes all the fats and oils, whether derived from the animal or the vegetable kingdom. The members of this extensive group are composed of carbon (ranging from 60 to 80 per cent) and hydrogen, with a little oxygen. Fat which has been taken with the food is mainly absorbed by the lacteals, although a portion of

*The researches of Boussingault on milch-cows, of Milne Edwards and others on bees, and of Lacase-Duthiers on the insects inhabiting galls, distinctly show that starch and sugar are capable of being converted into fat in the animal organism.

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it passes directly into the capillaries of the villi, as has been shown by microscopic examination, which has revealed the presence of fat-granules amongst the blood-corpuscles. The modifications which are impressed upon the fats, in order to prepare them for absorption, are explained in the article DIGESTION. Their uses in the system are various. In their oxidation in the organism, whether the process be gradual or rapid, a large amount of heat is liberated; and that they are oxidized, and for the most part ultimately resolved into carbonic acid and water, is evident, because they neither appear in any quantity in the excretions nor accumulate beyond a certain point in the organism. Moreover, in artificial, and doubtless in natural digestion, the presence of a little fat accelerates the solution of nitrogenous matters taken as food. Lastly, the occurrence of fat in milk, in the egg, in all plastic exudations, and in all highly cellular organs, is a clear indication that this substance plays an important part in the process of cell-formation; hence we may probably explain the therapeutic use of such medicines as cod-liver oil.

4. The *albuminous* group contains all those substances which are chemically known as the proteine-bodies (see PROTEINE), viz., albumen, fibrine, caseine, and the allied vegetable compounds, all of which are composed of very nearly the same proportions of carbon, hydrogen, nitrogen, and oxygen; while additionally they contain a little sulphur or phosphorus, or both: they all contain on an average about 15 per cent of nitrogen, a substance which has not occurred in the preceding groups. All these proteine-bodies, such as occur in the fluids of the egg, in animal flesh, in the curdy matter of milk, etc., are dissolved by the gastric-juice and intestinal fluid, and converted into matters termed *peptones*, which, although similar in their ultimate composition to the substances from which they are derived, differ from them in their greater solubility and more their ready diffusibility through animal membranes. Like the fats, they are chiefly absorbed by the lacteals, but to some extent by the capillaries. A reference to the chemical composition of the milk and of the fluids of the egg, shows that all the nitrogenous tissues in the body of the young animal must have been primarily derived from albumen or caseine; and it is established beyond all doubt that these substances are throughout life the essential producers of blood, and consequently of the various nitrogenous structures which are are built up from that fluid.

5. The *gelatinous* group (which formed a part of Prout's albuminous group) includes the different varieties of gluten, obtained by boiling, from many animal tissues; as, for example, bone-cartilage, tendons, skin, hoofs, etc. All soups and jellies which stiffen on cooling contain it, and such substances are popularly, but erroneously, regarded as highly nourishing. Unlike the preceding group, from which they only slightly differ in ultimate composition, they do not appear to form new blood, and their uses are still so questionable, that we will merely notice one function of them, which has been suggested by Liebig—viz., that these substances may go directly to the formation of such tissues as yield gluten on boiling, and which, if this food were not taken, would have to derive their nourishment from the members of the preceding group.

6. The *saline* group. With the exception of common salt (chloride of sodium), which we take instinctively in additional quantity with most kinds of food, the members of this group are unconsciously taken in the different articles of solid and fluid food on which we live. Want of space prevents us from noticing the different foods which yield the individual salts; but when we invariably find phosphate and carbonate of lime in the bones, in fixed and definite proportions; when we invariably find a nearly fixed proportion of chloride of sodium, alkaline phosphates, and other soluble salts, in the blood, flesh, milk, etc.; and when, further, we find that these substances are being constantly eliminated by the urine, it is obvious that they must be replaced by the food if we would keep the organism in its normal state. The evil consequences of a deficiency of any of these ingredients of food are well known; thus, when too little phosphate of lime (to which bone owes its firmness and hardness) is taken into the system, or when too much is again taken out (as occasionally, during pregnancy, when the fetal bones require it for their ossification), fractures do not readily unite.

It is only comparatively recently—during the last quarter of a century—that physiologists have satisfied themselves, that in order to supply the wants of the system, food must consist of a combination of these groups; and that animals which are fed exclusively on food belonging to one of the groups—as, for example, albumen or fibrin—perish under symptoms of inanition, as certainly as if they had been deprived of all nourishment. As in the infant's milk we find the albuminous, oleaginous, saccharine, and saline groups represented by the caseine, butter, sugar, and salts, so, for other periods of life, the food, whether derived from the animal or vegetable kingdom, must contain a due (although not necessarily the same) proportion of the different types. Again, in judging of the nutritive value of any kind of food, we must take into consideration its digestibility. Thus, the experiments made by Dr. Beaumont on Alexis St. Martin, a Canadian, in whom there was, in consequence of a gun-shot wound, a fistulous opening leading from the exterior to the interior of the stomach, and recent experiments made by Busch on a woman with a fistulous opening into the jejunum (see ALIMENTARY CANAL), show, for example, that hard-boiled eggs, meat that has been boiled for a long time, and hard cheese, which is poor in fat, are less easily and rapidly digested than soft-boiled or fresh eggs, meat steeped in

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vinegar, or moist, fat cheese, and that starch is much more readily converted into sugar when boiled than in the raw form.

As the nitrogenous constituents of the food (articles containing albumen, fibrin, etc.) are chiefly employed in the formation of the blood and the reproduction of the tissues, it was at one time thought that the quantity of nitrogen which any kind of food contained might be taken as a measure of its nutritive value; but this test is not altogether to be relied on, since the nitrogen in part depends upon the gluten-yielding matters, which probably contribute little or nothing to the formation of textures.

Both daily experience and chemico-physiological observations show us that the best kinds of food contain both fat and carbo-hydrates, in addition to albuminous matters. Instinct teaches us to combine highly amylaceous foods with fats; as, for example, bread and butter, beans and fat bacon; and the increased digestibility of such mixtures proves, no less than the simultaneous occurrence of fat and sugar in the milk and in the egg-fluids, that both substances are necessary, as independent ingredients of food, although, perhaps, one may temporarily serve as a substitute for the other. Unfortunately, we have no trustworthy data for enabling us to determine the proportion in which the different nutrient groups should be combined, so as to form the food best suited to the general wants of the organism. The proportions occurring in human milk are the following: 10 parts of plastic or blood-forming matter (caseine), 10 parts of fat (butter), 20 parts of a carbo-hydrate (sugar), and 0.6 of a part of salts. For the wants of adult life, a lesser ratio of plastic matter (albumen, etc.) would probably suffice.

The absolute quantity of food required for the maintenance of the human body in health varies so much with the age, sex, and habits of the individual, and with the circumstances in which he may be placed, that it is impossible to fix a standard applicable to every case; but from the consumption of food by large bodies of healthy men, such as our soldiers and sailors, we can determine with tolerable accuracy the *average* daily quantity. We extract the following remarks from Todd & Bowman's *Physiological Anatomy and Physiology of Man*. "Each seaman in the British naval service is allowed from 31 to 35¼ ounces of dry nutritious food daily, of which 26 ounces are vegetable, and the rest animal; the latter consisting of 9 ounces of salt meat, or 4½ of fresh. Sugar and cocoa are also given. The soldier is allowed a pound of bread, and three quarters of a pound of meat. In most of the London hospitals, full diet, which is given to convalescent patients who need a liberal diet, consists generally of half a pound of meat, with from 12 to 14 ounces of bread, half a pound of potatoes, a pint of milk, and sometimes beer or porter—a pint of the former, or half a pint of the latter. The former dietary is destined for men who must be in readiness for the most active athletic exercises, requiring not only great muscular strength, but also considerable power of enduring fatigue. The latter is intended to recruit the powers of those who have been suffering from disease. If, now, we compare with these a dietary which has been found sufficient for the support of health in a state of more or less confinement, with a moderate amount of daily labor, we may fairly infer that the proper allowance for persons not engaged in actual manual labor lies between these extremes. In the union workhouses of England, able-bodied men obtain about 25 ounces of solid food daily, of which the quantity of meat does not exceed 5 or 6 ounces. In prisons, it has been found necessary to give a certain amount of animal food to prisoners who are subject to hard labor. Each of such prisoners, if confined to a term exceeding three months, and kept at hard labor, has a daily allowance of about 36 ounces of food, of which meat constitutes only a very small portion—namely, about 16 ounces in the week. The prisoner has obviously the advantage of the poor man, whose only crime is poverty; but there is doubtless sufficient justification for this in the fact, that the labor of the prisoner, and the mental depression which long-continued restraint and confinement induce, render a greater amount of nutriment necessary than the indigent would require, who seek in the workhouse a shelter from absolute want." For further details on this subject, which is one of great practical importance, we may refer to a paper by Dr. Lyon Playfair, "On the Food of Man under Different Conditions of Age and Employment," published in 1854, in the 56th volume of the *Edinburgh New Philosophical Journal*, and to a memoir by Dr. E. Smith upon "Prison and other Dietaries." See also Dr. Pavy's *Treatise on Food and Dietetics* (2d ed. 1875).

It appears, then, that a daily amount of food, varying from 35 to 25 ounces, is sufficient to maintain health; and of this a fourth or fifth part ought to be animal food; but in special cases, much more or much less may be taken without apparent injury. The smallest quantity of food upon which life is known to have been supported with health and strength, is that on which Cornaro—whose history is recorded in most books on D. and dietetics—states that he subsisted, in order to reduce extreme corpulence, for a period of 58 years—viz., 12 ounces of food, chiefly vegetable, with 14 ounces of light wine. In contrast with Cornaro's case, we may refer to instances recorded by Parry and other arctic voyagers of the voracity of the natives of those cold regions. A young Esquimaux, who was allowed "unlimited diet," availed himself of the privilege to the extent of devouring, in 24 hours, 35 lbs. of various kinds of food, including tallow-candles; and the Cossacks of Siberia are reported to consume daily from 12 to 20 lbs. of animal food.

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An article upon D. would be imperfect without a reference to the best mode of dressing meat, for cooking and digestibility are closely allied. Most persons find meat that has been broiled most easily digested. The fire should be brisk, so that the albumen on the surface of the meat may be coagulated rapidly, and thus retain the internal juices. A similar rule applies, for the same reason, to boiling and roasting. When meat is to be boiled, it should be plunged into water already boiling; while, if soup is to be made, the meat should be put into cold water, and the temperature slowly and gradually raised —the object, in the former case, being to retain, in the latter, to extract, the nutritious fluids. (See BOILING and BROILING.) Fried meat and rich stews are usually very indigestible. Salted meat is not only harder and more indigestible than fresh meat, but the process of salting extracts important salt, and much of the nutrient juice from the meat; the only exception being fat pork, which is rendered more digestible by salting. On this subject, see Liebig's *Researches on Food*, 1847.

We shall conclude with a notice of certain substances which, although they are hardly entitled to be termed foods, may fairly be considered, from the universality of their use, to exert a definite influence on the organism, and to supply certain existing, although, perhaps, undefined wants. We refer to alcohol, tobacco, tea, and coffee.

From three series of observations made upon himself, Dr. Hammond arrives at the conclusion, that "alcohol increases the weight of the body, by retarding the metamorphosis of the old, and promoting the formation of new tissues, and limiting the consumption of fat." The respiratory and urinary excretions, and the fæces, were invariably diminished. These effects occurring when the amount of food was below the quantity required to maintain the weight of the body, were productive of no deleterious result to the system; but when the food was sufficient to balance the waste from the excretions, and still more, when an excess of aliment over the demands of the system was ingested, the health was disturbed, and disease almost induced. Hence the laboring-man, who can hardly find bread and meat enough to preserve the balance between the formation and decay of his tissues, finds in alcohol an agent which, if taken in moderation, enables him, without disturbing his health, to dispense with a certain quantity of food, and yet keeps up the weight and strength of his body. On the other hand, he who uses alcohol when his food is more than sufficient to supply the waste of tissue, and, at the same time, does not increase the amount of his physical exercise, or drink an additional quantity of water (by which the decay of tissue would be accelerated), retards the metamorphosis, while an increased amount of nutriment is being assimilated, and thus adds to the plethoric condition of the system which excessive food has a tendency to produce.

Tobacco, according to the experiments of the same excellent observer, resembles alcohol in these respects, that when the food is sufficient to preserve the weight of the body, it increases that weight; and when the food is not sufficient, and the body, in consequence, loses weight, it restrains that loss; but it differs from alcohol in being unattended with any unpleasant effects upon the circulation, though its action on the brain is apparent in increased nervous excitement, followed by a pleasant feeling of ease and contentment. In these experiments, Dr. Hammond, who was not in the habit of using tobacco in any form, smoked 450 grains daily.*

Tea and coffee are usually believed to have a somewhat similar effect to that which, as we have shown, is produced by alcohol and tobacco. The power of tea in arresting the waste of tissues has, however, been called in question. The value of alcohol and other stimulants was the subject of an elaborate controversy in several numbers of the *Contemporary Review* for 1878.

DIET, the assembly of the German states, a body of very ancient origin, in which the monarch formerly deliberated with his subjects upon measures proposed for the interests of the empire. It was a feudal, not a representative, body. When feudalism was destroyed it became a congress of princes, the emperor no longer presiding in person but by commissioners, and the princes sending envoys. The emperor was, theoretically at least, elected by universal suffrage, the chief men naming the candidate and the people ratifying their choice. The forms and rules of election were settled by the Golden Bull of 1356. The diet was constituted of the electoral college, the princes of the empire spiritual and temporal, and the free imperial cities. The electoral college was composed of three archbishops, representing the German church, and four secular electors. The princes, save in the matter of electing an emperor, had the same rights as the electoral college. The powers of the free imperial cities were quite limited. Each of the three colleges voted separately. When they agreed on a measure it was submitted to the emperor for ratification or for rejection, but he had no power to modify it. No measure affecting the welfare of the empire could be passed without the assent of the diet. The regular meetings were held twice a year. After the close of the thirty years' war the power of the body declined.

* Dr. Brinton, in his excellent article on "The Stomach and Intestine," in the *Cyclopædia of Anatomy and Physiology*, refers to an instance of the partial starvation of a large ship's crew on a long voyage, in which the *chewers* of tobacco were alleged to have endured hunger far better than the other sufferers, while the *smokers* did not enjoy the same advantage. This fact, however, does not invalidate our statement, and only shows, as we might *à priori* have expected, that the effects of chewing are more powerful than those of smoking. When the system receives its due supply of food, tobacco, if used at all, should be used in moderation.

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DIETERICHS, JOACHIM FREDERICK CHRISTIAN, an eminent veterinary surgeon, was b. on the 1st of Mar., 1792, at Stendal, in Prussia. In 1818, he undertook, at the instance and expense of the Prussian government, a tour through France, Würtemburg, Bavaria, Austria, and Hungary. On his return, he was appointed to a chair in the veterinary college in Berlin, which he held for four years. In 1830, he accepted a post in the general military school of Berlin, where, in 1841, he was appointed professor in ordinary. He died in 1858.

DIETERI'CI, KARL FRIEDRICH WILHELM, 1790–1859; a native of Berlin, educated at Königsberg, devoting his attention chiefly to mathematics. He was an engineer in Blücher's army, 1813–15, and in 1820 was engaged in the ministry of public instruction. In 1834, he became professor of political science in the university of Berlin, and in 1844 was placed at the head of the statistical bureau. He published a number of important works on political economy and statistics.

DIETRICH OF BERN, the name under which the Ostrogoth king, Theodoric (q.v.) the great, appears in the German heroic legends; in which by Bern, his capital, Verona is to be understood. As early as the 7th c., he would seem to have become the center of a distinct cycle of legends. A little later, he was, with a not unusual disregard of all historical truth, brought into connection with the traditions of Attila, or Etzel. According to these legends, D. is said to have fled from Italy before Ottacher (Odoacer), or Ermanarich; to have met, along with his attendant vassals, with a hospitable reception from Etzel; but after many years, to have again got possession of his kingdom. The extermination of the royal house of Burgundy by Attila, which is an historical event, was the cause that D., as well as Etzel himself, was woven into the Burgundian and Frankish Siegfriedssage; and thus he appears, in the second part of the *Nibelungen*, at Etzel's court, and is handled by the poet with special predilection. There have been numerous poems, besides, of which D. was the center and principal hero. It is very probable that the *Hildebrandslied*, of the 8th c., is a fragment of such a poem. Except this, we have only late versions of these legends; for example, *Schlacht vor Raben* (Ravenna) of the 13th c.; *Alphart's Tod* (13th c.); *Zwerg Laurin, oder der kleine Rosengarten* (15th c.); *Dietrich's Ahnen; Dietrich's Flucht*, etc.

DIEU ET MON DROIT (God and my right). The parole of Richard I. at the battle of Gisors, 1198, signifying that he was not subject to France, but owed his power to God alone. The king was victorious over the French, and the battle word was adopted as the motto on the coat of arms of England. During the reign of queen Anne, *Semper eadem* ("Always the same") was substituted, but the former motto was restored by her successor.

DIEZ, FRIEDRICH CHRISTIAN, the founder of the philology of the Romanic languages, was b. at Giessen, 15th Mar., 1794, and educated at Giessen and Göttingen. During the greater part of the years 1819–20, he lived, at Utrecht as a domestic tutor. In 1822, he went to Bonn as a *privat-docent*, and in 1830 was there appointed professor of modern literature. His first work, *Altspan. Romanzen*, was issued in 1821. Since then, he has published a great number of valuable works on the Romanic languages, two of which are worthy of special mention—the *Grammatik der Romanischen Sprachen* (Grammar of the Romance Languages, 3 vols., Bonn, 1836 to 1842), and the *Etymologisches Wörterbuch der Romanischen Sprachen* (Etymological Dictionary of the Romanic Languages, Bonn, 1853). The last of these works, in particular, is recognized not only by Germans, but by the scholars of all the Romanic nations, to be the basis for the scientific study of all the Romanic languages. He was actively engaged in work till his death, May 29, 1876. See his life by Stengel (1883).

DIFFERENCE; DIFFERENCES; CALCULUS OF FINITE DIFFERENCES. The word difference means usually the excess of one quantity over another of the same kind, and this is its meaning in arithmetic. In the higher branches of mathematics, however, it has a peculiar meaning, which we shall briefly explain. When we have a series of numbers connected by a regular, though not obvious law, the character of that law may be detected by forming a new series of the *differences* between each term of the original series and the next, and then treating the new series (which we may call the series of "first differences") in the same way; and so on, till we reach a series of differences the law of which is manifest. Thus,

Given series, . .	4,	7,	11,	18,	31,	54,	92,	151
First differences, .	3,	4,	7,	13,	23,	38,	59	
Second differences, .	1,	3,	6,	10,	15,	21		
Third differences, . .	2,	3,	4,	5,	6			

The law of the series of third differences is manifest; we see that its next term must be 7, which gives 28 as the next term of the series of second differences, 87 as the next of the first differences, and so 238 for that of the original series, which we can thus continue to any number of terms. To take a simpler case. Let the series be

	43,	47,	53,	61,	71
First differences, ...	4,	6,	8,	10	
Second differences, ...	2,	2,	2		

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Here the law is manifest in the first differences, and we should be able to calculate the series if we knew the first terms of the three series; viz., 43, 4, 2. It is on this principle that calculating machines (q.v.) can be constructed to compute tables of logarithms, etc. Out of the method of differences sprung the calculus of finite differences, first treated by Dr. Brook Taylor, under the name of the method of increments. This calculus has nothing to do with the transcendental analysis. See CALCULUS DIFFERENTIAL, etc. It deals with the changes of functions when *definite* increments are made to the variables; while the transcendental analysis considers only their changes when indefinitely small or infinitesimal additions are made to the variables. It would be out of place here to attempt an account of the calculus of finite differences. See FUNCTIONS.

DIFFERENCE ENGINE. See CALCULATING MACHINE.

DIFFERENCES, in heraldry, though often, or indeed generally, confounded with marks of cadency (q.v.), have, in strict usage, a totally different function—the former being employed to distinguish brothers and their descendants after the death of the father, the latter whilst he is still alive. Differences in this limited sense may consist either of a chief added to or a bordure placed round the plain shield borne by the head of the house; or should the shield exhibit any of the ordinaries, as the bend, fess, pale, etc., the difference may be indicated by an alteration on the lines. The proximity of the bearer to the head of the house is indicated by the character of the line by which the differencing chief, or bordure, or ordinary is marked off from the field, the following being the order usually observed: the first or eldest brother, on the death of his father, inherits the pure arms of the house; the second brother, if the difference is to consist of a bordure, carries it plain; the third, ingrailed; the fourth, invected; the fifth, embattled; etc. Other modes of differencing have been invented by heralds, and are not unknown to practice; such, for example, as changing the tinctures either of the field or of the principal figures, of which Nisbet gives many famous examples—altering the position or number of the figures on the shield, adding different figures from the mother's coat or from lands, and the like. Where the cadet is far removed from the principal family, if the field be of one tincture, it is sometimes divided into two, the charge or charges being counter-charged, so that metal may not lie on metal, or color on color. The confusion between differences and marks of cadency, above referred to, is by no means peculiar to the heraldic usage of England, though there it is more prevalent than in Scotland. In France, the cadets of the house of Bourbon have been in the habit of continuing these marks, and at the present day, as in Mackenzie's time, the label or lambel is to be seen on the arms of all the members of the Orleans family. That no distinction between what we call marks of cadency and differences was there observed, is further apparent from the fact that, whilst such was the practice of the house of Orleans, the house of Anjou carried a bordure gules, and that of Alençon a bordure gules charged with eight bezants. In Germany, sir George Mackenzie says that the several branches of great families distinguish themselves only by different crests (*Precedency*—Works, ii. 616); and he gives as the reason, that all the sons succeed equally to the honors of the family. In Britain, and in France, some change is always made on the shield as carried by the head of the house; but the practice even of good heralds has been so irregular, as to bring the rule very nearly to what Mackenzie holds to be the correct one—viz., that every private person should be allowed, with the sanction of the proper authorities, "to make what marks of distinction can suit best with the coat which his chief bears."

DIFFERENCES, CALCULUS OF. See DIFFERENCE.

DIFFERENTIAL CALCULUS. See CALCULUS.

DIFFERENTIAL THERMOMETER. See THERMOMETER.

DIFFERENTIATION, in mathematics, the process of finding the differential of a function. When a function of two or more independent variables is differentiated as if all the variables but one were constants, it is called partial differentiation. See CALCULUS.

DIFFRACTION, or INFLECTION, of the rays of light. It was observed by Grimaldi that if a beam of the sun's light be let into a dark room through a very small hole, the shadows of things in this light will be larger than they ought to be if the rays passed by the bodies in straight lines, and that these shadows have three parallel fringes, bands, or ranks of colored light adjacent to them.

This phenomenon was originally known under the name of diffraction, and was supposed to arise from the refraction of the atmosphere. This explanation was disproved by the observations of Newton, who, from the conception which he was led to form of it, called the phenomenon the "inflection of the rays of light." It is now identified with a larger class of phenomena, which have been much more completely explained in the later development of the theory of light, and are assigned, on the hypotheses of Fresnel, to the interference of undulations. See INTERFERENCE. The observations and experiments of Newton on the subject, as detailed in the third book of his work on Optics, are, however, extremely interesting and instructive, and with regard to accurate observation and description, apart from the imperfect state of the theory, leave nothing to be desired.

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Having made in a piece of lead a small hole with a pin, whose breadth was the 42d part of an inch, Newton let into the darkened chamber a beam of the sun's light. In this light, the shadows of all bodies were bordered with three parallel fringes or bands of colored light. The shadow of a hair, too, was found to be much broader than the hair itself, and fringes of light were observed within it.

Again admitting light into the darkened apartment by a hole a quarter of an inch wide, he allowed it to pass between two knife-edges parallel to one another. In this case, owing to the breadth of the hole by which the light was admitted, the fringes did not appear within the shadows of the knives until the knife-edges were brought to approach one another, when they appeared. By making the hole smaller through which the light was admitted, they became more distinct. "As the knife-edges continually approached one another, the fringes grew distincter and larger, until they vanished. The outmost fringe vanished first, and the middlemost next, and the innermost last; and after they were all vanished, and the line of light which was in the middle between them was grown very broad, a shadow began to appear in the middle of this line, and divide it along the middle into two lines of light, and increased until the whole light vanished. This enlargement of the fringes was so great, that the rays which go to the innermost fringe seemed to be bent above twenty times more when this fringe was ready to vanish than when one of the knives was taken away."

The order of these phenomena is then made clear by the following experiment: "I caused the edges of two knives to be ground truly straight, and pricking their points into a board, so that their edges might look towards one another, and meeting near their points, contain a rectilineal angle, I fastened their handles together with pitch, to make this angle invariable. The distance of the edges of the knives from one another at the distance of four inches from the angular point, where the edges of the knives met, was the eighth of an inch; and therefore the angle contained by the edges was about 1° 54′. The knives thus fixed together I placed in a beam of the sun's light, let into my darkened chamber through a hole the 42d part of an inch wide, at the distance of 10 or 15 ft. from the hole." When the fringes of the shadows of the knives fell perpendicularly upon a paper at a great distance from the knives, they were in the form of hyperbolas.

The best mode for exhibiting the phenomena of diffraction, and that now generally adopted for that purpose, is as follows: The rays of sunlight being reflected horizontally through an aperture into a darkened apartment, are concentrated by a combination of lenses to a very small focus. By this means the light is made to diverge from a very small circle, with the advantage of a greater concentration of light than is obtained by simply admitting the sunlight through a small aperture. The edges of the shadows of every object placed within the cone of light diverging from this focus, will exhibit the fringes above described.

By means of metal-leaf arranged upon a plate of glass, shadows can now be thrown upon a screen, so as to exhibit at once all the most peculiar phenomena of this class.

On the assumption of Fresnel, the explanation of the whole phenomena above described is most complete and satisfactory, the fringes and dark lines being produced by the undulations alternately strengthening or destroying each other. A very beautiful experiment, devised by Fresnel for the purpose, is found to furnish a complete verification of the theory. See INTERFERENCE.

DIFFUSION, the gradual dispersion of particles of one liquid or gas among those of another—or of the particles of a solid in a liquid holding it in solution. It is of the greatest importance in terrestrial physics, being the cause of the uniform composition of the atmosphere at all elevations, and one of the causes of the speedy dissipation of noxious gases and vapors in the open air, and of the nearly uniform saltness of the sea, etc., so necessary to animal and vegetable life.

We shall consider the above cases in detail, and in addition the transfusion, as it has been called, which occurs when different gases or liquids are separated from each other by a porous plate or membrane. The principal experiments on this subject are those of Graham and Bunsen—to be found in the *Philosophical Transactions* or Graham's *Chemistry*, and in Bunsen's *Gasometry*.

1. *Diffusion of Gases.*—If two flasks be filled, one with hydrogen, the other with chlorine, and connected by a long tube fitted into their necks by corks—in whatever position the compound apparatus be placed it will be found that the gases mutually interpenetrate—in this particular case the color of the chlorine enables us to follow by the eye the course of the diffusion. When the mixture has attained its permanent state, each of the gases is found to be uniformly diffused through the whole containing space, precisely as it would have been had the other not been present. In fact, the presence of a second gas seems merely to affect the *time* which the first takes to distribute itself equably throughout the vessel, and in no other way to influence the final result. (Dalton, long ago, suggested the analogy of the passage of water among stones in the bed of a river.) The pressure of the mixture is the sum of the pressures corresponding to each of the gases, if separately occupying the space which they jointly fill; and the same is true of a mixture in any proportions of any number of gases, so long, at all events, as they do not act chemically upon each other.

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Precisely the same is true of vapors. If, for instance, a few drops of ether be injected into an exhausted receiver, there will be an almost instantaneous conversion of a definite quantity into vapor, so that its tension shall have a certain value depending on the temperature alone. If air be present in any quantity whatever, the vaporization will proceed more slowly, but the final amount converted into vapor will be the same as in the former case. A familiar illustration of this is afforded by the dew-point, which is a temperature merely, having no connection with the height of the barometer.

Next let us take the case of a gas forced by difference of pressure, from one vessel to another through a very small hole in a thin metallic plate—one of the vessels, for instance, being full of the gas, and the other connected with an air-pump kept continually in action. Experiment and theory, such as it is, agree in giving in this case, for the velocity with which the different gases pass through the orifice, under similar circumstances as to pressure, a result inversely proportional to the square root of the density of each gas. Now, if, instead of the plate with the small hole, we substitute a thin layer of bladder or other membrane, or a thin disk of plaster of Paris, it appears from experiment that the results are sensibly the same. Thus, if we have the same gas at different pressures on opposite sides of such a layer or disk, the rate of passage of the gas through it, from greater to less pressure, will, for the same pressures, but different gases, vary according to the above law; and, moreover, the presence of a second gas will in no degree modify the rate of transfusion of the first. If, therefore, a glass tube, say an inch in diameter, and 2 or 3 ft. long, have a diaphragm of plaster of Paris formed near one end, and that end ground flat, so as to be perfectly closed by a glass plate, it may be filled with hydrogen by displacement, its other and lower extremity being plunged into water, and care being taken not to wet the diaphragm. If the glass plate be now removed, transfusion will take place—hydrogen passing out as if into a vacuum, and the constituent gases of air entering also as if into a vacuum. On account of the comparative lightness of hydrogen, the velocity with which it escapes will be considerably greater than that with which the others enter; so that the immediate effect will be a rise of the water in the tube. After a short time, the whole of the hydrogen escapes, and the tube will contain only air. The proportion of the volume of the latter to that of the hydrogen may be calculated from the above law—remembering that the hydrogen is practically diffusing into a vacuum all along, and the air entering by the pressure of the atmosphere in excess over that of the air in the tube. Allowing for the unavoidable errors of experiment, the verifications of these results are very satisfactory. It has been attempted to deduce these laws as consequences of the dynamical theory of gases. See a remarkable paper by Maxwell in the *Philosophical Magazine* for 1860.

Bunsen has suggested the application of the method of diffusion to the very important question in gas analysis—whether the constituents of a gas, as determined by the usual methods, are merely *mixed*, or are chemically united. It is evident that, in general, the diffusion rate of a mixture of two gases will differ from that of a compound of the same.

2. *Diffusion of Saline Matters in Solution.*—If a strong brine be placed in the bottom of a tall glass jar, pure water may be carefully introduced above it, so that no immediate mixture takes place. If the whole be allowed to stand, the salt is gradually diffused through the vessel, which, after a sufficient time, will be found to contain a brine of uniform strength. Experiments have been carefully made to determine, in such a case as the above, the distribution of the salt through the vessel at various periods *before* the permanent state has been arrived at. They have been compared with the results of the theory now to be explained, and the coincidence has been found very satisfactory. The theory assumes that the rate of diffusion between contiguous layers of the water in the cylinder is proportional to the excess of salt in one layer above that in the next—the co-efficient of proportionality involving a special constant of diffusion for the particular salt experimented upon. This is precisely the assumption that is made about the linear conduction of heat in a homogenous solid, or the propagation of electricity in a wire. The partial differential equation to which all of these cases are reducible, $\left(C\frac{du}{dt} = \frac{d^2u}{dx^2}\right)$, was obtained, and its complete solution exhibited in various forms long ago by Fourier, in his *Théorie de la Chaleur*, one of the most remarkable mathematical investigations of last generation. See HEAT, CONDUCTION OF, and ELECTRICITY, THEORY OF. It is curious to consider the heating of a metallic rod, or the solution of a few crystals of salt in a tall glass jar full of water, as problems thus directly allied to the signaling through the Atlantic cable.

Graham's method of determining the diffusion co-efficient of a salt in water was simple, and yet admitted of great precision in the determinations. A number of glass bottles, cast in the same mold, had their mouths ground flat, so as to be accurately closed by a plate of glass, which—when the bottle, filled with a solution of known strength, had been carefully placed in one of a series of equal glass jars, and covered with a constant amount of water—could be slipped off without producing any considerable disturbance in the fluid. After a measured time, the glass plate was replaced, and the amount of salt which had left the bottle accurately determined.

The following are the most important of the laws thus obtained; they are quite consistent with the theory above mentioned. For solutions of the same substance, of dif-

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ferent degrees of strength, the rate of diffusion is proportional to the strength of the solution. Different salts seem to arrange themselves in groups as regards their diffusion co-efficients, the latter having simple numerical relations to each other. Analogy of chemical composition and of crystalline form appear to be the principal elements in the arrangement of the groups. The quantity diffused increases with the temperature, and at the same rate for all salts. The presence of a second salt in the solution, or in the water into which the diffusion takes place, if not in large quantity, appears not to affect the result, supposing, of course, that no chemical action takes place. It is evident that by this process a partial separation may be effected of salts which have different rates of diffusion, and do not act chemically on each other; and it is found that in certain cases even chemical compounds, such as alum, may be partially decomposed by the same means.

3. *Diffusion of Liquids. Osmose.*—If sulphuric acid be carefully poured through a tube into the bottom of a vessel filled with water, colored by an infusion of litmus, or red cabbage, the change of color of the vegetable dye will enable us to trace the gradual diffusion of the acid in the water. Here, the process, though probably on the whole quite analogous to the case of gases, occupies more time; but the final result is, as in the former case, an almost uniform mixture of the two fluids. There is no necessity for any special remark on this part of the subject, particularly as we have already adverted to the theory of this process. But if different fluids be separated by a membrane or diaphragm, some extremely remarkable results are obtained, which were first carefully examined by Dutrochet. These have been attributed to the action of osmotic force, something of the same kind as capillary force, and probably a closely connected, if not identical form of molecular action. The theory of these actions is not yet well understood, but we shall endeavor to give from analogy a few attempts at explanation.

If an inverted funnel, with a very long stem, have a bladder tied over its mouth, and, being filled to the neck with sirup of sugar, be suspended so that the bladder is entirely under the surface of water in a dish, the sirup will pass through the bladder into the water, and the water will pass through in the opposite direction, but in far greater quantity—producing the extraordinary effect of a rise in the level of the fluid in the tube, which can with precaution be made to amount to a yard or two in the course of a few days. The points of the attempted explanation of this phenomenon are somewhat as follows: The bladder has more capacity for, or will absorb more of, water than of sirup. The first effect, then, is to saturate the bladder with water, very slightly mixed with sirup. On the lower side of the bladder, water, with a small quantity of sugar in solution, is diffusing into pure, or nearly pure water, this process will be a slow one; at the upper side, water (nearly pure) is diffusing into a strong sirup. Here, then, the effect is much greater, and thus a greater quantity of water passes upwards than of sirup downwards. Similar effects may be produced with a vast number of other liquids. Combined with capillarity, it is believed that these experiments explain the motion of the sap in vegetables, and various other phenomena in the vegetable and animal kingdoms.

DIGAMMA, an obsolete letter of the Greek alphabet, equivalent in sound to the English *w*. In some of the earlier Greek dialects the old γ was a kind of aspirate, which, from its form, like one capital Γ over another, was called digamma, and written F. The Pelasgians carried this aspirate into Italy, where it remained in Latin as a real consonant, in such words as *vinum*, *ovum*, from the Greek Fοῖνος, Fῶον. The digamma had disappeared as a character from the Greek language before the days of Homer. See Monro, *Homeric Grammar* (1883).

DIGBY, a co. in s.w. Nova Scotia, on the bay of Fundy; 1300 sq.m.; pop. '91, 19,807. Digby is the chief town. Wheat and oats are largely produced.

DIGBY, village and seaport, Digby co., Nova Scotia, on the bay of Fundy, reputed for its curing of a variety of small herrings or pilchards, which are smoked and dried for export; they have a high flavor, and are known in trade as Digbies. Pop. '91, 1381.

DIGBY, Sir Kenelm, the son of sir Everard Digby, noted as one of the gunpowder plot conspirators, was b. in 1603, three years before the execution of his father. He was brought up in the Protestant faith, and at the age of 15 was entered at Gloucester hall, Oxford. After leaving the university, where he had acquired the reputation of great ability, he spent two years in continental travel. He returned to England in 1623, and was knighted in lord Montague's house. Under Charles I., he was a gentleman of the bedchamber, and held several public offices. In 1628, he equipped a squadron at his own expense, and sailed first against the Algerines, and subsequently against the Venetians. In 1632, on the death of Dr. Allen, of Gloucester hall, D. inherited his collection of books and manuscripts. In 1636, when in France, he was converted to the Roman Catholic faith. He returned to England in 1638, and on the breaking out of the civil war, he was imprisoned as a royalist in Winchester house, but in 1643 he was allowed to retire to France. At Paris, he was received with favor by the court, and made the acquaintance of Descartes. After Charles I. had fallen, D. returned to England, but the parliament forbade him the kingdom, under penalty of death. Retiring to the continent, he traveled in France and Italy; but in 1655, he was again in England, and was in frequent attendance at the court of the protector. He went again

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to France, and busied himself with the preparation of philosophical papers. He returned to England in 1661, and died there in 1665. D. married a daughter of sir Edward Stanley of Tongue castle, in Shropshire, by whom he had one son.

His works are numerous, and on a great variety of subjects, comprising *A Conference with a Lady about the Choice of a Religion* (Par. 1638); *Observations on Spenser's Fairy Queen* (Lond. 1644); *A Treatise on the Soul, proving its Immortality* (Par. 1644); *Of the Cure of Wounds by the Powder of Sympathy* (Lond. 1658); and *Discourse on Vegetation* (Lond. 1661), etc. *The Private Memoirs of Sir K. Digby*, etc., *written by Himself*, were published in London in 1827. D.'s library, which was removed to France when the civil war broke out in England, became, on his death, the property of the French king.

DIGBY, KENELM HENRY, son of the Rev. William Digby, dean of Clonfert, b. 1800; educated at Cambridge, and graduated in 1823. He soon afterwards became a convert to the Roman Catholic church and began to write semi-religious works, among which are *Mores Catholici, or Ages of Faith; Compitum, or the Meeting of Ways at the Catholic Church; The Broad Stone of Honor, or Rules for the Gentlemen of England; Evenings on the Thames;* etc. He d. 1880.

DI'GEST, a name often given to the pandects (q.v.) of the civil or Roman law, because they contained "Legalia præcepta excellenter digesta."

DIGESTER, PAPIN'S, is a strong boiler with a closely-fitting cover, in which articles of food may be boiled at a higher temperature than 212° F. As its name implies, it was invented by Papin, and a common form is the *autoclave*, where the lid can be turned round under clamps or ears, and thus be rendered steam-tight. The lid is fastened down by a screw, and the steam generated in the boiler is allowed to escape at a stop-cock, or by raising a weighted valve. The increased pressure to which the contents of the boiler are exposed, causes the boiling-point of the water to rise to 400° F., and occasionally higher. The digester is of great value as a means of preparing soups of various kinds, and especially in the extraction of gelatine from bones.

DIGESTION, ORGANS AND PROCESS OF. The function or process of digestion is one of the chief of those organic functions which are directly concerned in maintaining the life of the individual, inasmuch as it is that through which the animal is enabled to receive aliment, and to prepare or modify it for being assimilated to, and appropriated by, the various organs of the body, or, in other words, for being converted into blood.

The general expression, "function of digestion," includes several minor or subordinate processes. According to Milne Edwards, the acts of the digestive function may be classed as follows: 1. There is the prehension of the food; 2. Its mastication; 3. Its insalivation; 4. Its deglutition; 5. Its chymification or stomachal digestion; 6. Its chylification or intestinal digestion; 7. Defecation; and 8. The absorption of the chyle.

Before examining these acts in succession, and the mechanism by which each is effected, we must have clear conceptions regarding the classification of food, the quantity of food, and other allied subjects, which are discussed in the article DIET; and we should likewise have some knowledge of the causes of those sensations which we call *hunger* and *thirst*, which are, or ought to be, our natural guides regarding the periods for taking food, and the quantity to be taken. The immediate cause of ordinary hunger cannot be explained; but that it is due to some peculiar condition of the gastric mucous membrane, seems probable from the fact, that the sensation continues after division of the pneumogastric nerves, from which the stomach mainly derives its nervous fibers, if we correctly interpret the feelings of the animals on which the experiments were made. In extreme hunger, the sufferer complains of a sense of sinking, which is referred to the region of the stomach, while general faintness and sometimes considerable pain are present. Hunger, or the want of food which occasions it, may be diminished by rest, sleep, or any cause that retards the general change which is perpetually going on in all the tissues of the body. We have shown in the article DIET, that tobacco and alcohol have a power of limiting the disintegration of the tissues, and thus of keeping off or diminishing hunger. When the sensations of extreme hunger are not relieved by food, the body begins to feed upon its own tissues, and the symptoms of starvation (q.v.) begin to manifest themselves. The period at which death occurs from abstinence, varies greatly in different animals—young animals always dying sooner than older ones. In man, total privation of food usually causes death in about a week; but if a little drink be allowed, life is considerably prolonged.

Thirst is dependent upon a peculiar condition (probably undue dryness) of the mucous membrane of the upper part of the digestive tube. The thirst in febrile affections is, however, probably due to the morbid state of the blood.

We now proceed to the consideration of the different acts of which the digestive function is made up. See FOOD AND DRINK.

1. In the act of prehension, man and many of the lower animals (monkeys, squirrels, etc.) employ the hands or anterior extremities and mouth; the lips and anterior teeth, and, to a certain extent, the tongue, being also employed in this function. In the lower animals, however, the modes of prehension are various. Some (like the giraffe) twist the tongue around the leaves and young branches of trees; others (the ant-eaters) have a remarkably long tongue, covered with a viscid secretion, and by thrusting this organ into ant-

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hills, etc., secure their prey; and in the chameleon among reptiles, and the woodpecker among birds, the tongue seems specially developed for prehensile purposes. In the elephant, this act is accomplished by the prolongation of the nostrils into the organ popularly known as the trunk, In other mammals (the ruminants and solipeds), the large pendulous lips are the organs employed. In birds, the bill (which is a modification of the lips) is always the prehensile organ of that class.

The prehension of fluids is effected in two ways: sometimes the liquid is poured into the mouth, and is allowed to fall into it by its own weight; in other cases, the tongue is used after the fashion of a piston, being drawn within the mouth so as to exhaust the anterior part of that cavity, and fluids are thus forced to enter by atmospheric pressure.

2. Mastication is effected in the cavity of the mouth by means of the teeth. This cavity is bounded superiorly by the palate or roof of the mouth, and in other directions by the cheeks, lips, and tongue. Projecting into its interior, above and below, is an arched series of teeth, which are firmly fixed by roots into corresponding sockets in the upper and lower jawbones. The upper jaw (and consequently the dental arch imbedded in it) is immovable, or only movable with the entire head; but the lower jaw, with its teeth, is capable of moving upwards, downwards, backwards, forwards, and laterally, by means of the powerful muscles of mastication. It is by the varied movements of the lower teeth against the upper, through the action of these muscles, that the food is broken down or masticated. For information regarding the structure, etc., of the teeth, see TEETH; see also DENTITION.

The operation of mastication is very important, since the more the food is broken down the more easily will it mix with the saliva and other fluids which participate in the digestive process.

3. Insalivation is effected by the admixture of the secretions of the three pairs of salivary glands (the parotids, the submaxillaries, and the sublinguals) and of the buccal mucus with the triturated food. A brief description of these structures is given in the article GLAND. The common saliva, formed by the combined secretion of these various secreting organs, is a colorless, turbid, viscid, inodorous, and tasteless fluid, which, after standing for some time, deposits a layer of pavement epithelium (see EPITHELIUM) and mucus corpuscles. In the normal state, its reaction is alkaline, but the degree of alkalinity varies, and is greatest during and after meals. Saliva does not contain more than five or six parts of solid constituents to 995 or 994 parts of water, the most important ingredients being an organic matter termed *ptyaline*, and sulphocyanide of potassium, neither of which substances occurs in any other solid or fluid of the body. The daily quantity of saliva secreted by an adult man is estimated at about 48 ounces, but determinations of this kind must be regarded only as approximations to the truth, since the activity of the salivary glands is dependent upon various influences and conditions. Thus, movement of the lower jaw, as in masticating, speaking, or singing, increases the secretion; as also do acrid and aromatic substances, and dry hard food; while the use of moist and soft food is accompanied by a scanty secretion.

The uses of the saliva in reference to digestion are partly mechanical and partly chemical. The mechanical uses are almost too apparent to require notice. The moistening of the dry food by the saliva serves the double purpose of adapting it for deglutition and of separating the particles, and thus allowing them to be more freely acted on by the other digestive fluids; moreover, from its viscidity, it lubricates the bolus of food, and thus facilitates deglutition; and it is probably also subservient to the sense of taste. The great chemical use of the saliva is to convert the amylaceous (or starchy) portion of the food into glycose or grape sugar, and thus to promote its absorption.

4. Deglutition is the act by which the food is transferred from the mouth to the stomach. The pharynx, or cavity into which the mouth leads, takes so slight a part in the digestive process, that we need scarcely allude to any anatomical details connected with it. It is sufficient to observe that between it and the mouth is the pendulous or soft palate, which is a movable muscular partition that separates the two cavities during mastication. As soon, however, as the latter act is accomplished, and the bolus is pressed backwards by the tongue, the soft palate is drawn upwards and backwards, so as to permit the passage of the food into the pharynx. The bolus or pellet of food having arrived near the esophagus or gullet (which is continuous inferiorly and posteriorly with the pharynx), is driven into it by the action of certain muscles, which almost surround the pharynx, and are termed its *constrictor* muscles. All voluntary action ceases as soon as the food is pressed backwards by the tongue into the pharynx. It is impossible to recall the pellet, and it is necessarily carried on (without even our cognizance) into the stomach. On receiving the food forced into its upper extremity by the action of the constrictor muscles of the pharynx, the esophagus is dilated (for it usually lies in a collapsed state, with its walls in contact, or nearly so); this contact of the pellet with its mucous membrane causes its muscular walls to contract, and the food is thus driven, by a series of these contractions, into the stomach. The act of deglutition is now completed.

5. Stomachal digestion or chymification is the next process to be considered. The whole of the alimentary canal (q.v.), (fig. 1) below the diaphragm (q.v.), or great muscular partition which separates the cavity of the chest from that of the abdomen or belly,

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possesses the following points in common, in relation to structure: The stomach, the small intestine, and the large intestine, are all lined by mucous membrane, have a muscular coat, consisting of two sets of distinct fibers—namely, circular fibers which surround the tube or viscus after the manner of a series of rings, and longitudinal fibers running in the same direction as the intestine itself—and are invested with a serous membrane, the peritoneum (see SEROUS MEMBRANES), which at the same time retains the viscera in their proper position, and permits their necessary movements.

The human stomach is an elongated curved pouch, lying almost immediately below the diaphragm, and having the form of a bagpipe. It is very dilatable and contractile, and its function is to retain the food until it is duly acted upon and dissolved by the gastric juice, which is secreted by glands lying in its inner or mucous coat, and then to transmit it, in a semi-fluid or pulpy state, into the duodenum. Its average capacity is about five pints. The parts of it which have received special names are the greater curvature (fig. 1) *b*, the lesser curvature, upon its upper border, and the cardiac, *c*, and pyloric, *d*, extremities.

The mucous membrane, or lining coat of the stomach, is thick and soft, and lies in irregular folds, in consequence of the contraction of the muscular coat, unless when the organ is distended with food. On opening the stomach, and stretching it so as to remove the appearance of folds, we perceive even with the naked eye, but better with a lens, numerous irregular pits or depressions, irregular in shape, and averaging about $\frac{1}{100}$th of an inch in diameter. To see them properly, the mucus with which they are filled must be washed out (fig. 2, A). These pits are so shallow as not to dip into the mucous membrane to a greater extent than $\frac{1}{4}$th or $\frac{1}{5}$th of the thickness. The rest of the thickness is chiefly made up of minute tubes, running parallel to one another, and vertically to the surface of the stomach (fig. 2, B). These are the gastric tubes or glands which secrete the gastric juice from the blood in the capillaries which abound in the

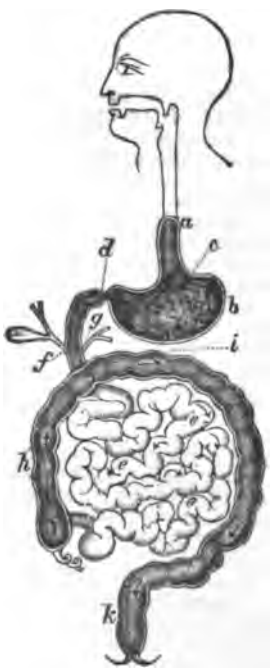


FIG 1.

Human Alimentary Canal.

a, œsophagus; *b*, stomach; *c*, cardiac orifice; *d*, pylorus; *e*, small intestine; *f*, biliary duct; *g*, pancreatic duct; *h*, ascending colon; *i*, transverse colon; *j*, descending colon; *k*, rectum.

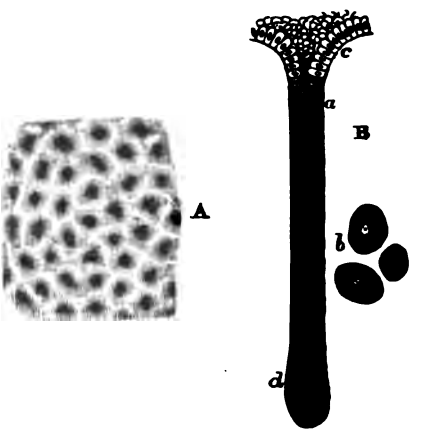


FIG. 2.

A, inner surface of the stomach, showing the cells after the mucus has been washed out, magnified 25 diameters. B, stomach-tube from the middle of the human stomach, magnified about 150 diameters: *a*, wall of the tube, lined with large oval nucleated cells; *b*, the same cells isolated; *c*, nucleated cells of columnar epithelium, occupying the upper parts of the tubes; *d*, blind extremity of the tube.

mucous membrane. They pass in twos, threes, or fours from the bottom of each pit, and usually subdivide into several tubes, which, after running a more or less tortuous course, terminate in blind or closed extremities. These tubes are filled with epithelial cells, whose contents are composed of granules, with which oil-globules are often mixed, and each tube is invested with capillaries, which usually run in the direction of its long axis. In the pyloric or duodenal end of the stomach, these tubes (at least in the dog and several other animals whose stomachs have been carefully examined in a perfectly fresh state) are considerably wider than those which we have described, and differ from them also in other respects; and hence some physiologists believe that while they collectively secrete the gastric juice, one set may secrete the acid fluid and the organic matter

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termed pepsine, and the other mucus; the free acid and the pepsine are, as we shall shortly see, the two essential constituents of the gastric juice.

When food is introduced into the stomach, three special phenomena are induced in that viscus: 1. There are certain movements induced which are dependent on its muscular coat; 2. The mucous membrane is altered in appearance; and 3. There is the secretion of the gastric juice. Each of these phenomena requires a brief notice.

On killing an animal while the act of digestion is going on, and at once laying open its abdomen, we find that the stomach is in a contracted state, firmly embracing its contents, and with both its orifices so closed as to prevent the escape of the food, this contraction being due to the stimulation of the muscular coat by the food. If we examine the movements of the stomach during digestion, which we can do either by exposing the stomach of a living animal, or by sending a magneto-electric current through this organ in an animal just killed, we perceive that, in the cardiac half or two thirds, the movements are extremely slow, the muscular coat apparently contracting on the food, and progressively sending it towards the pylorus; whilst in the pyloric end of the stomach the movements are more energetic and rapid, resembling the peristaltic or vermicular movement, which we shall presently describe as occurring in the intestinal canal. When the transverse constriction has reached the firmly shut pylorus, a relaxation lasting about a minute ensues, followed by a repetition of the circular contractions. The movements which these contractions impress upon the food are described by Dr. Beaumont in the following terms: "The food entering the cardiac end of the stomach, *c*, turns to the left, descends into the splenic extremity, *s*, and follows the great curvature towards the pyloric end, *d*. It then returns in the course of the smaller curvature, and makes its appearance again at the cardiac aperture in its descent into the great curvature to perform similar revolutions. These revolutions are effected in from one to three minutes." This account, given by Dr. Beaumont, is based on the observations which he made in the stomach of Alexis St. Martin, a Canadian, with a fistulous opening into the stomach, whose case is referred to in the article DIET. Dr. Brinton, however, adopts a modified view, which is probably the correct one. He supposes that the semi-fluid food entering at *c* (fig. 3), the cardiac orifice, goes in the directions marked *a*, partly along the greater and partly along the lesser curvature; and that these two currents of food meet at the closed pylorus, when they are both reflected into the direction *b*, forming a central or axial current, occupying the real axis of the stomach which unites the two apertures. The mutual interference of these currents at their borders causes a uniform admixture of the various substances composing them, while the reflection of the upper and lower currents into one another insures an equal contact of all the mass with the secreting surface of the mucous membrane.

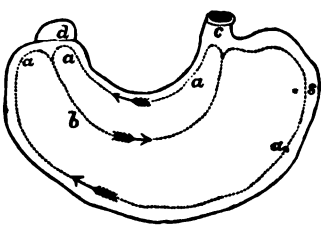


FIG. 3.
Diagram to show the general direction of movement impressed on the semi-fluid food in the stomach.
aa, the hemispherical or surface current, carrying the semi-fluid food towards the closed pylorus, where it is reflected into *b*, the central current, which unites the cardiac (*c*) and pyloric (*d*) openings.

The changes in the mucous membrane are mainly the following: The inner surface of the healthy fasting stomach is of a paler pink tint than after the introduction of food, and while in the latter case the reaction of the moisture on the surface is very acid, in the former it is neutral, or even alkaline. Dr. Beaumont found (in the case of Alexis St. Martin) that, on the introduction of food into the stomach, the vessels of the mucous membrane became more injected, and that its color became changed from a pale pink to a deep red. A pure colorless and slightly viscid fluid, with a well-marked acid reaction, was then observed to distill from the surface of the membrane, and to collect in drops, which trickled down the walls, and mixed with the food.

That the *gastric juice*, which is the term applied to the acid fluid which Dr. Beaumont saw exuding from the mucous membrane, and which is secreted or formed in the gastric tubes which we have already described, is capable of exerting a solvent action on food, is proved by numerous experiments. It was first ascertained by Reaumur (1752), who obtained some of this fluid by making animals swallow sponges with a string attached, by which he could withdraw them. He thus showed that alimentary substances out of the body were altered by this fluid in the same manner as they are changed in the stomach, and disproved the favorite theory of that period, which ascribed all the changes which the food underwent in the stomach to a species of trituration. The subject of *artificial digestion*, or digestion out of the body, has, since that period, been carefully investigated by many observers, and there is now no doubt that the changes which the food undergoes in the stomach are essentially chemical, and not mechanical.

Two years before Beaumont's experiments, Dr. Prout had ascertained not only that an acid fluid is secreted by the gastric mucous membrane of rabbits, hares, horses, dogs, etc., during digestion, but that the acid is the muriatic or hydrochloric acid, and it was supposed that the solvent action of the gastric juice was due to this source. But experi-

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ments showed that the solvent action is not due simply to the acid of the gastric juice, and that the latter must contain some other ingredient which, either alone or in combination with the acid, can exercise this power. It was then discovered that the addition of a portion of the gastric mucous membrane to water acidified with hydrochloric acid produced a perfect digestive fluid, due attention being paid to the temperature, which should be kept at about 100°, or about the normal temperature of the interior of the animal body. Later observations showed that we can obtain from the gastric mucous membrane the special organic matter on which its digestive power depends, and to this substance the name of *pepsine* has been given. The two essential elements of the gastric juice are then: 1. A free acid, which in some cases seems to be hydrochloric alone, and in others a mixture of hydrochloric and lactic acids; and 2. An organic matter, which is found on analysis to be highly nitrogenous, and to be allied to the albuminates, and which we term pepsine. The best analysis of human gastric juice is that made by Schmidt of Dorpat, who, in 1853, had an excellent and rare opportunity of examining it in the case of an Esthonian peasant, Catharine Kütt, aged 35 years, and weighing about 118 lbs., in whom there had existed for three years a gastric fistula or opening, three or four lines in diameter, under the left breast, between the cartilages of the ninth and tenth ribs. The introduction of dry pease and a little water into the stomach, through the opening, occasioned (even in the morning, on an empty stomach) the secretion of from 5 to 7 ozs. of a clear limpid fluid with an acid reaction, which, however, was much less strong than Schmidt had observed in previous experiments on the gastric juice of dogs and sheep, in which he had artificially established similar fistulous openings. The following table gives the mean of two analyses of the gastric juice of Catharine Kütt, with corresponding mean results of the same fluid in the sheep, a purely herbivorous animal, and in the dog, a purely carnivorous animal.

	Human Gastric Juice.	Sheep's Gastric Juice.	Dog's Gastric Juice.
Water	994.40	986.15	971.17
Solid constituents	5.60	13.85	28.83
Pepsine	3.20	4.20	17.51
Hydrochloric acid	0.20	1.56	2.70
Chlorides of sodium, etc.	2.08	6.00	5.88
Phosphates	0.12	2.09	2.74

The only impurity that could affect these analyses, is the saliva that possibly might have been swallowed.

The quantity of the gastric juice secreted in 24 hours was determined by Bidder and Schmidt (*Die Verdauungs-säfte*, etc.) in the sheep to be $\frac{1}{4}$th, and in the dog $\frac{1}{10}$th of the weight of the body. If the latter ratio were true for men, a man of ten stone weight would secrete about 14 lbs. of this fluid daily. In the case of Catharine Kütt, the mean daily quantity amounted to no less than 31 lbs., or to more than a fourth part of the weight of her body. On this calculation, a man of ten stone would daily secrete 37 lbs. of gastric juice.

The uses of this fluid in reference to digestion are clear. It serves not only to dissolve, but also to modify the nitrogenous elements of the food (such as albumen, fibrin, casein, and, in short, all animal food except fat, and the blood-forming portion of vegetable food), converting them into new substances, termed *peptones*, which, although they coincide in their chemical composition, and in many of their physical properties, with the substances from which they are derived, differ essentially from them in their more ready solubility in water, and in various chemical relations. Thus, albumen is converted by the gastric juice into albumen-peptone, fibrin into fibrin peptone, etc. According to the investigations of Meissner, the albuminates are simultaneously decomposed or broken up into peptones and substances which he terms *parapeptones*, which latter are not further changed by the action of the gastric juice, but are converted into peptones by the action of the pancreatic juice, with which they come in contact in the duodenum.

All the best observers agree that the gastric juice exerts no apparent action on the non-nitrogenous articles of food—namely, the fats and the carbo-hydrates (sugar, starch, etc.); as, however, the fats exert a favorable influence on the digestion of nitrogenous matters, it is probable that they undergo some slight, although not appreciable, modification. Gelatine and the gelatinous tissues are, as far as is known, the only nitrogenous articles of food which are not converted into peptones and parapeptones by the action of the gastric juice.

Although the main object of the gastric juice is to dissolve the albuminates, etc. (e.g., the contents of the egg, flesh, cheese, etc.), it appears from the experiments of Lehmann, Schmidt, and others, that it cannot dissolve the quantity necessary for the due nutrition of the organism. According to Lehmann, gastric juice can only dissolve $\frac{1}{50}$th of its weight of coagulated albumen, while Schmidt makes the quantity as low as $\frac{1}{125}$th. Now, since a dog secretes about $\frac{1}{10}$th of its weight of gastric juice daily, it would only be able—even taking Lehmann's estimate, which is more than twice as high as Schmidt's—to digest 5 parts of dry or coagulated albumen for every 1000 parts of its

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weight; but a dog, in order to keep in condition on an exclusive flesh diet—and this is its natural food—should take 50 parts of flesh, containing 10 parts of dry albuminates, for every 1000 parts of its weight. Hence its gastric juice only suffices for the digestion of half the albuminates necessary for nutrition—a result which is in accordance with the observed fact, that a considerable portion of the albuminates enters the duodenum in an undissolved state, and which will be explained when we consider the part which the intestinal juice—the fluid secreted by the various glands lying in the mucous membrane of the small intestine—takes in the digestive process. On comparing the experiments made on dogs with those made on Catharine Kütt, it appears that in the human subject the gastric digestion of the albuminates is much more imperfect than even in the dog.



Fig. 4.

The under surface of the stomach and liver, which are raised to show the duodenum and pancreas.

st, stomach; *p*, its pyloric end; *l*, liver. *g*, gall-bladder; *d*, duodenum, extending from the pyloric end of the stomach to the front, where the superior mesenteric artery (*sm*) crosses the intestines; *pa*, pancreas; *sp*, spleen; *a*, abdominal aorta.

The process of gastric digestion is slow. According to Beaumont's researches on Alexis St. Martin, the mean time required for the digestion of ordinary animal food, such as butcher's meat, fowl, and game, was from two hours and three quarters to four hours.

The next point to be considered is: What becomes of the matters that are thoroughly dissolved in the stomach? Are they absorbed, without passing further down the canal? or do they pass through the pyloric valve into the duodenum, and are they finally taken up by the lacteals? Two of our highest authorities in physiological chemistry, Frerichs and Donders, maintain that the absorption of the peptones commences in the stomach; but the view generally adopted is, that the albuminates, etc., which are converted into peptones, are for the most part taken up by the lacteals. The rapidity with which

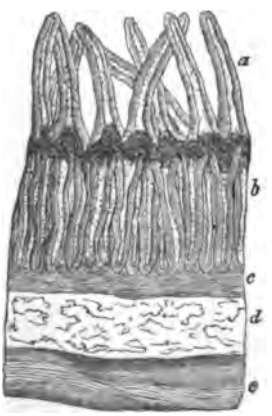


Fig. 5.

Vertical and longitudinal section of the small intestine in the lower part of the jejunum, showing the general arrangement of its coats.

a, villi; *b*, intestinal tubes or follicles of Lieberkuhn; *c*, submucous areolar tissue; *d*, circular muscular fibers; *e*, longitudinal muscular fibers.



Fig. 6.

Two villi, denuded of epithelium, with the lacteal vessels in their interior.

a, limitary membrane of the villus; *b*, basis of the same; *c*, dilated blind extremity of the central lacteal; *d*, trunk of the same.

aqueous solutions of iodide of potassium, the alkaline carbonates, lactates, citrates, etc., pass into the blood, and thence into the urine, saliva, etc., shows that the absorption of fluids must take place very shortly after they are swallowed, and there is little doubt that the blood-vessels (capillaries) of the stomach constitute the principal channel through which they pass out of the intestinal tract into the blood. As the veins of the stomach, which are formed by the union of these capillaries, contribute to form the portal vein (see Circulation), the absorbed matters pass directly to the liver, and probably stimulate it to increased secretion (fig. 4).

6. We must now follow the progress of the semi-fluid mass, known as the *chyme*, from the stomach into the small intestine, and notice the changes which are collectively impressed upon it, and are known as *chylification* or intestinal digestion. But before

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we can satisfactorily do this, we must say a few words regarding the intestinal mucous membrane, with its various glands, etc., and on the changes which take place in it during digestion.

The mucous membrane of the small intestine resembles that of the stomach in so far as it is of considerable thickness, and consists in a great measure of laterally grouped tubes. The reader is referred to fig. 5, which exhibits a section of the mucous membrane of the small intestine in the dog. These tubes, which form the great mass of the middle portion of the section marked *b*, are commonly called the *follicles of Lieberkuhn*, although they were first described by Brunner. They are straight, nearly uniform in diameter throughout their entire length, and are parallel to one another, and perpendicular to the inner surface of the small intestine on which they open. Nothing is known of the exact nature of their secretion; but in association with the secretions of other glands, they combine to yield the intestinal juice whose characters and uses will shortly come under our notice.

The projecting bodies marked *a* in the figure are termed the *villi;* they are minute processes of the mucous membrane of the small intestine, and obviously serve to increase to a great extent the amount of absorbing mucous membrane. They first appear in the duodenum, where they seem to develop themselves as elongations of the partitions between the cells or pits into which the tubes open. Comparatively scanty in number at first, they become very numerous (covering the whole surface) in the further part of the duodenum and the rest of the small intestines, giving to the mucous membrane a velvet-like or pilous appearance; they finally cease at the ileo-cæcal valve, which forms the boundary between the small and large intestine. In man, they are conical in shape, and measure from $\frac{1}{12}$th to $\frac{1}{60}$th of an inch in length. They vary much in shape and size in the lower mammals and in birds. (In carnivorous animals, as the dog, they are longer and more filiform than in man.)

The structure of a villus (fig. 6) is somewhat complicated, but we must endeavor to explain it, because, without tolerably accurate knowledge on this point, no one can understand how most of the essential elements of food (the albuminates and fatty matters) make their way from the intestine to the blood. Each villus is provided with an abundant set of capillaries, which doubtless absorb fluid matters, which thus find their way directly from the bowels into the blood (fig. 7). A single artery enters its base, and passing up its center, divides into a capillary plexus, which almost surrounds the villus immediately beneath the mucous membrane. From these arise small veins, which usually pass out of the villus in two, three, or more trunks, and contribute to form the portal vein. See CIRCULATION.

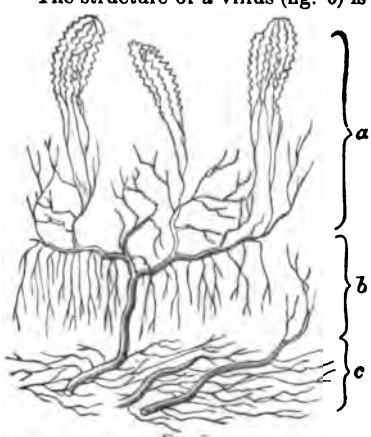


Fig. 7.

Vertical section of the coats of the small intestine, showing the capillaries and the beginnings of the portal vein. The arteries are not seen, not having been penetrated by the injection which has been thrown into the portal vein.

a, vessels of the villi; *b*, those of the tubes or follicles of Lieberkuhn; *c*, those of the muscular coat.

The villus also contains in its interior one or more *lacteals*, which are vessels with club-shaped closed extremities, which absorb the chyle from the intestine. Their milk-white appearance, when they are filled with chyle, suggests the origin of their name. The tissue which occupies the cavity of the villus, in which the lacteals are imbedded, and which supports the capillary plexus, is in a great measure made up of nuclei and granules, except at the free extremity, where a vesicular structure, resembling very minute fat globules, is apparent.

There is abundant evidence that the function of the villi is connected with absorption, and mainly with the absorption of chyle. 1. The villi exist only in the small intestine, where the absorption of food goes chiefly on. 2. They are most developed in that part of the intestine where chyle is first formed. 3. They are turgid, enlarged, and opaque during the process of chylification, and small and shrunken in animals that have been kept fasting for some time before death.

In addition to the villi, the mucous membrane of the small intestine presents numerous transverse folds, which are termed the *valvulæ conniventes*, from their valvular form and from their movements under water resembling the winking motion of the eyelids (fig. 8). Each fold passes round three fourths or more of the gut; and in the lower part of the duodenum, and in the jejunum (the parts in which they are most fully developed) they are often more than half an in. in depth; further on, they diminish in depth, length, and number, and in the lowest part of the ileum they can scarcely be traced. Their object clearly is to increase the extent of the absorbent mucous membrane.

In addition to Lieberkuhn's follicles or tubes, which exist in the whole of the smaller intestine, there are other glandular or secreting structures, imbedded in the submucous tissue of certain portions of the intestinal tract, which require consideration. These

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are: 1. Brunner's glands, which occur only in the duodenum; 2. Solitary glands, which seem to occur in all parts of the intestine, both small and large; and 3. Peyer's glands, which are usually confined to the ileum.

Brunner's glands are most abundant at the pyloric end of the duodenum. In structure, they resemble the pancreas, their ultimate elements being bunches of vesicles, from which minute ducts arise, which coalesce and form larger ducts, through which the secretion is poured into the duodenum. It is believed that they secrete a fluid similar to the pancreatic juice. The *solitary glands* occur in all parts of the intestine, but are perhaps more numerous in the jejunum than elsewhere. Each gland is a simple membranous flask-shaped vesicle, the neck corresponding to the surface of the intestine, while the rounded base lies in the submucous tissue. The neck presents no opening, and how the contents, which consist of nuclei and granular particles, are discharged into the intestine, is not clearly known. As we never see them larger than a mustard-seed, we may presume that, on attaining that size, they burst. *Peyer's glands* (fig. 9) are apparently mere aggregations of solitary glands, forming oval patches in the ileum. These patches vary in size and number, being largest towards the cæcum, where their long diameter sometimes measures 3 or 4 in., and smallest towards the jejunum; while their number varies from 15 to 20, or even more. Nothing certain is known regarding the uses of these solitary or aggregated glands; but as they are largest during the digestive process, we must infer that they are in some way connected with that function. Possibly the peculiar odor of the fæces may be due to their secretion. In typhoid or enteric fever, and in phthisis, these glands become ulcerated, which probably occasions the diarrhea so common in these diseases.

Brunner's glands are much more developed in the herbivora than in the carnivora; Peyer's, on the other hand, are most developed in the latter.

We have endeavored, in the preceding sentences, to give the reader some idea of the complicated structure of the mucous and submucous coat of the small intestines; we now proceed to notice the chief uses of the muscular coat of the intestine. This coat,



FIG. 8.

Small intestine distended and hardened by alcohol, and laid open to show the valvulæ conniventes.

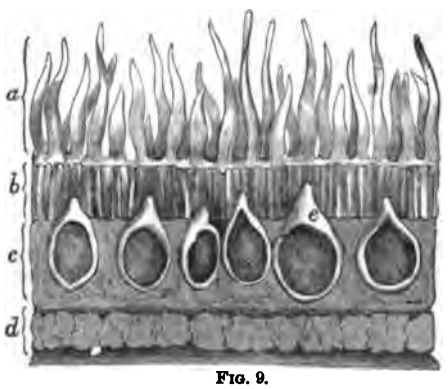


FIG. 9.

Vertical section through a patch of Peyer's glands in the dog. *a*, villi; *b*, tubes of Lieberkuhn; *c* submucous tissue, with the glands of Peyer imbedded in it; *d*, muscular and peritoneal coats; *e*, apex of one of the glands projecting among the tubes.

as has been already mentioned, consists of two layers of muscular fibers—namely, circular and longitudinal fibers, of which the former lie next to the submucous coat. The peristaltic or vermicular action by which the substances which enter the duodenum from the stomach are moved onwards, is due to this muscular coat. A person who has once seen the abdomen of an animal laid open immediately after death, will have a better idea of the nature of this movement than can be afforded by any description. It commences about the pyloric third of the stomach, from whence successive wave-like movements are propagated through the entire length of the intestinal canal. It is the rapid succession of these alternate contractions and relaxations that impels the intestinal contents onwards, and occasion those movements which, from their resemblance to the writhings of a worm, have been termed *vermicular*. It is very probable that the rapidity of this movement varies in different individuals—those persons, for example, whose bowels act twice daily having a more rapid vermicular motion than those in whom the act of defecation occurs only once in the twenty-four hours.

We have now to consider the effects produced on the chyme by the different fluids with which it becomes mixed in the small intestine. These fluids are: 1. The bile; 2. The pancreatic juice; and, 3. The intestinal juice.

The bile (see BILE) is a faintly alkaline or neutral fluid, containing two essential constituents, one of which is of a resinous nature, while the other is a pigment. The resinous constituent is not precisely identical in all kinds of bile, but it generally consists of a soda-salt whose acid is either glyco-cholic or tauro-cholic acid, or of a mixture

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of these salts. Strecker, to whom we are mainly indebted for our knowledge of the chemistry of the bile, states that in most mammals the resinous constituent merely differs in the varying proportions in which the taurocholates and glycocholates are intermixed, the former usually preponderating. According to Lehmann, the resinous constituent amounts to at least 75 per cent of the solid residue. The bile-pigment occurs in the bile of different animals under two forms—namely, as a brown and as a green pigment, the latter probably only differing from the former in being mere highly oxidized. There has never been a case in which physiologists have had an opportunity of directly observing the quantity of bile that is secreted by the human subject, and all our information on this subject is derived from observations on animals, in which the *ductus choledochus communis* (see LIVER) has been tied, and a fistulous opening established into the gall-bladder. If the same proportion of bile to bodily weight holds good in man as in the dog, a man weighing ten stone would secrete daily about five pounds of bile. All observers agree, that the amount of the biliary secretion varies directly with the quantity of food; and as animals with biliary fistulæ (in whom all the bile escapes externally, instead of making its way into the duodenum) usually have voracious appetites, experiments on this point are easily made. There is great discrepancy of opinion as to how soon after a meal the bile flows most abundantly into the intestine. According to Kölliker and Müller, whose experiments were made on dogs fed only once a day, very little bile is secreted in the first and second hour after a meal, more in the third, fourth, and fifth; the maximum being sometimes attained in the fifth, sometimes not till the eighth hour.

Numerous and somewhat discrepant views have at different times been advanced regarding the functions of this fluid; we shall here only notice those functions which are connected with digestion. One use that has been ascribed to it, is to neutralize in the small intestine the acid chyme which emerges from the stomach. But the bile can contribute little or nothing to the neutralization of the free acid, because, in the first place, the bile is very slightly alkaline, and often perfectly neutral; and secondly, because the chyme in the intestime is still acid after the admixture of the bile. Again, the bile has been asserted to possess a special solvent action on the chyme; but none of the ordinary constituents of the latter seem to be essentially changed, even when digested for a long time with fresh bile. Again, much importance has been attached to the antiseptic action of the bile on the contents of the intestinal canal, in favor of which view it is alleged that when no bile is poured into the intestine, the fæces have a putrid odor, as is sometimes observed in patients with jaundice, and as was noticed by Frericha in animals in which the *ductus choledochus* had been tied. Another use that has been assigned to the bile is, that it exerts a stimulating action on the intestinal walls, and thus acts as a natural purgative; and in support of this view, it may be mentioned that jaundice (in which the bile does not flow into the intestine) is often accompanied by extreme constipation, and that purified ox-gall, taken either in the form of pill or enema, produces an undoubted purgative action. But the main use of the bile seems to be to promote the digestion of fatty matters, and it accomplishes this end not so much by any solvent chemical action on the fats (which at most is extremely slight), as by a peculiar physical action both on the fats and on the intestinal walls, disintegrating the former, and impressing on the latter (by moistening the villi) a peculiar condition which singularly facilitates the absorption of fatty matters. This view is fully confirmed both by direct experiments out of the body, and by comparing the relative qualities of fat that are retained in the body and applied to the purposes of life by animals with biliary fistulous openings, and by healthy animals.

The pancreatic fluid which is poured into the duodenum at the same spot with the bile (see fig. 1), is a colorless, clear, somewhat viscid and ropy fluid, devoid of any special odor, and exhibiting a strong alkaline reaction. This fluid, as yielded by different dogs with permanent fistulous openings, varies considerably in chemical composition; the collective solid constituents ranging from 1.5 to 2.3 per cent, the organic matters from 0.9 to 1.6, and the mineral matters from 0.62 to 0.75.

The most abundant and important of the solid constituents is a peculiar substance termed *pancreatine*, or pancreatic diastase or ferment, in combination with soda, to which this fluid owes its principal chemical and physiological properties. Calculating from the quantity of pancreatic juice secreted by dogs of known weight, we may infer that a man weighing ten stone secretes daily about ten ounces of this fluid.

One of the chief uses of the pancreatic juice in relation to digestion, is to convert into sugar the amylaceous or starchy matters which have escaped the action of the saliva, and have passed unchanged into the duodenum. It possesses this property in a far higher degree than the saliva; and, as might be expected in reference to this use, the pancreas is found to be much more developed in herbivorous than in carnivorous animals. Bernard, the representative of the modern school of physiology in France, claims for this fluid another important function; he believes that he has proved that it is solely by the action of this secretion that the fat is reduced to a condition in which it can be absorbed and digested; that is to say, that it is decomposed into glycerine and a fatty acid. See FATS. This view, has, however, not been generally accepted, and it seems probable that although the change described by Bernard takes place when fat and pancreatic juice are simply mixed together in a test-tube, it does not actually

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take place in the intestine, the acid gastric juice probably acting as an interfering agent. An attempt has lately been made by Corvisart and Meissner to prove that, like the gastric juice, this fluid can dissolve albuminous matters; but this view cannot be substantiated. Considering the large quantity of pancreatic fluid which is yielded in 24 hours, Schmidt, who has made the digestive juices the subject of his special study, is of opinion that the function of this fluid is not so much to promote the conversion of starch into sugar, as for the purpose of diluting the chyme, and for reconverting the soda (which in the pancreas has been separated from the chlorine of the chloride of sodium, and has combined with the pancreatine) into chloride of sodium. He shows, from numerical calculations, that more than half of the chloride of sodium existing in the blood which circulates through the pancreas, is broken up into hydrochloric acid and soda, of which the former is separated by the gastric glands, while the latter unites with the pancreatine. Meeting again in the duodenum, the hydrochloric acid and the soda reunite, and re-form chloride of sodium, which is again absorbed, and re-enters the circulation. This is perhaps one of the most singular decompositions and reunions occurring in the animal body.

Of the last of the fluids poured into the intestine, and co-operating in the digestive process, the *intestinal juice*, we know comparatively little. It is the aggregate secretion of the various glands which we have described as occurring in the walls of the small intestine. It is a colorless, or sometimes yellowish, ropy, viscid fluid, which is invariably alkaline. We are not aware of any special or characteristic constituent in it, such as occurs in the other chylopoietic fluids. Its daily quantity is probably nine or ten ounces. It seems to unite in itself the leading properties of the pancreatic and gastric juices; that is to say, it resembles the former in converting starch into sugar, and the latter in dissolving flesh and other albuminous bodies.

We shall conclude this part of the subject with a few remarks on the chemical composition of the contents of the small intestine. On laying open the gut, we usually find a semi-solid admixture of imperfectly digested and indigestible substances and of the constituents of the digestive fluids in a more or less changed condition. The reaction of this mass varies in different parts of the canal, and in some measure with the nature of the food. Thus, the contents of the stomach always redden litmus paper, whatever kind of food has been taken; the duodenal contents are also always acid, but in a far less intense degree; in the jejunum we meet with only a faint acid reaction, which altogether disappears in the ileum; while in the cæcum, and sometimes in the lower part of the ileum, an alkaline reaction occurs. After a purely flesh diet the acid reaction disappears shortly below the duodenum, while, after the sole use of vegetable food, it may sometimes be traced even to the cæcum. As a general rule, the contents of the large intestine are alkaline.

In consequence of the rapid absorption that goes on along the intestinal surface, we meet with a comparatively small amount of soluble matters in these contents. Among these soluble matters we often find glycose (or grape-sugar), which seems to owe its origin to the metamorphosis of starch, and not to sugar having been present in the food; for after saccharine food has been taken, we rarely meet with it in any quantity in the small intestine, its absorption taking place with great rapidity. In the alcoholic extract of these contents we can almost always find evidence of the presence of biliary constituents. In the duodenum, and for a little way beyond it, we find glycocholic and tauro-cholic acid; descending a little further, they rapidly diminish, till we find the products of their disintegration; while in the large intestine, little more than a trace of these products can be detected. These chemical observations confirm the experiments of Schmidt, which show that nearly half the bile which is poured into the duodenum is decomposed before it reaches the middle of the small intestine.



FIG. 10.

Cæcum inflated, dried, and opened to show the arrangement of the valve.

a, termination of the ileum; *b*, ascending colon; *c*, cæcum; *d*, a transverse construction projecting into the cæcum· *ef*, lips of the valve separating the small from the large intestine; *g*, the vermiform appendix of the cæcum.

7. We have now arrived at the seventh stage of the digestive process, that of *defecation*. The line of demarcation between the small and large intestine is very obvious, and by the peculiar arrangement of the ileo-cæcal valve (see fig. 10), matters are allowed to pass forward with facility, while regurgitation is impossible. For anatomical details regarding the large intestine, we may refer to the articles ALIMENTARY CANAL, CÆCUM, and COLON. The contents of the large intestine differ very materially from those which we have been considering in the last paragraph, and constitute the fæces. They are more solid and homogeneous, and are often molded into a definite shape by the cells of the colon. The only essential change which the contents undergo in this part of their course is, that they increase as they pass onward in solidity, in consequence of the absorption of fluid from them by the mucous membrane. They are propelled forward

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into the rectum by the vermicular action which has been already described. Here they accumulate, being prevented from escaping by the contraction of the sphincter muscle—a band of strong muscular fibers surrounding and closing the gut at its lower extremity. The act of defecation, or of expulsion of the fæces from the rectum, is effected partly by the muscular fibers of that part of the intestine which are stimulated to contraction by a certain degree of distension, and which are to a certain extent under the influence of the will, and partly by the simultaneous contractions of the abdominal muscles and of the diaphragm, which, by reducing the antero-posterior and transverse diameters of the abdominal cavity, compress the intestinal canal in such a manner as greatly to assist the expulsive action of the rectum. These forces, or some of them (for usually the detrusive action of the muscular fibers of the rectum is sufficient), overcome the passive contraction of the sphincter, and the act of defecation is the result.

The fæces consist of a mixture composed of undigested particles of food (such as vegetable cellular tissue, fragments of tendon, skin, and half-digested muscular fiber), of epithelium and mucus (derived from the intestinal walls), and of traces of decomposed biliary matters. Their peculiar odor is ascribed by some to the secretion of Peyer's glands, and by others to decomposed bile; while Liebig refers it to a decomposition of albuminous matters, founding his view upon the fact, that by burning albumen with potash, he could manufacture in the laboratory odors of a fæcal character. The last is the least probable view. Their color varies with the food. On a mixed diet, they are of a yellowish-brown tint; on a flesh diet, much darker; and on a milk diet, quite yellow —and they become darker on exposure to the air. Their reaction is most commonly but not invariably alkaline. Their daily quantity is very variable; the mean of 17 observations made by a German physiologist, Wehsarg, was about 4.6 ounces, of which very nearly one ounce was solid matter, the rest being water; the largest and the smallest quantities being ten, and rather more than two ounces. Liebig, many years ago, made the observation that the insoluble salts of the food are mainly carried off by the fæces, while the soluble salts are for the most part eliminated by the urine. For further details on the chemistry of this subject, we must refer to the elaborate Memoirs of Dr. Marcet, published in the *Philosophical Transactions*.

8. The absorption of the chyle forms the completion of the digestive act. The coats of the intestines contain two perfectly distinct sets of vessels—one through which blood circulates, and the other containing a milky or transparent fluid, chyle or lymph, which, after a somewhat circuitous route, is poured into the blood. We have already referred to the fact, that fluids are absorbed from the stomach and intestine by the veins and capillaries of the mucous membrane; we now proceed to notice the mode in which the vessels of the second kind, the lacteals, act as absorbing agents. The lacteals are merely a portion of the great lymphatic system of the body, which will be described in a future article. See LYMPHATICS. They commence, as has been previously mentioned, in the villi, and possibly also in the intervening mucous membrane; and when an animal is killed while the digestive process is going on, they have, in consequence of their being distended with chyle, the peculiar white or milky appearance which procured for them their name of *vasa lactea*, from their discoverer, Asellius, in 1622. They pass in great numbers, and in a reticulated arrangement, between the layers of the mesentery, the portion of peritoneum (q.v.) which surrounds the gut, and retains it in its proper position. After passing through the mesenteric glands, where their contents seem to become more highly organized, they make their way to the right side of the aorta in the lumbar region, where they finally discharge themselves into an elongated pouch, termed the *receptaculum chyli*. From this pouch, the thoracic duct, containing the chyle, passes upward along the vertebral column till it reaches the level of the arch of the aorta, behind which it runs to the left side, and discharges its contents into the subclavian vein, close to its origin with the internal jugular, its orifice being protected by two valves. The nature of these contents has been already described in the article CHYLE. This chyle is, in reality, incipient blood, which has been formed, as we have already seen, from the food, and has been absorbed from the intestine by the lacteals. We have now traced it to its entrance into the general circulation, and it only remains for it to pass, in conjunction with the venous blood with which it is mixed, through the lungs, in order to be converted into new and perfect arterial blood, fit for the highest processes of organization.

We shall conclude this article with a notice of some of the most striking peculiarities presented by the digestive organs in the lower animals.

In the mammalia, we have three different forms of stomach—the *simple*, the *complex*, and the *compound*. In the *simple* form, the organ consists of a single cavity, as in man, but the form may vary to a great extent. It is most simple and relatively smallest in carnivorous animals. This is the most common form of mammalian stomach. In the *complex* stomach, that viscus is made up of two or more compartments communicating with one another, but often without presenting any marked difference of structure. The kangaroo, the porcupine, and the squirrel, afford good examples of this form of stomach. In the cetacea, the stomach consists of from five to seven cavities, that communicate with each other; but whether their functions are similar or different is not known. The *compound* stomach occurs in the ruminants (the cow, sheep, camel, etc.);

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it consists of four distinct cavities, differing very materially in their size, and in the arrangement and structure of the lining mucous membrane. The first, and by far the largest cavity, is the paunch or *rumen;* it occupies a great part of the abdominal cavity, and is the receptacle into which the food is received when first swallowed. The second cavity is termed (from the peculiar arrangement of the lining membrane, which forms deep polygonal cells) the honey-comb or *reticulum*. The third cavity presents a foliated appearance internally, and is hence popularly known as the manyplies. In anatomical works, it is sometimes termed the *psalterium*, and sometimes the *omasum*. The fourth division, termed the reed or *abomasum*, is somewhat of a pyriform shape, and is the true digestive stomach, in which alone gastric juice is secreted, all the preceding cavities being merely for the purpose of preparing the food for the more essential changes which it is here destined to undergo. The food first passes in a crude unmasticated state into the paunch, which, like the crop of birds which we shall presently notice, serves as a receptacle for the food until the act of feeding is concluded, and moistens it with the fluid secreted from its walls. The water, however, which the animal drinks, seems to pass directly into the second stomach. During rumination, small portions of the food pass from the paunch into this second stomach, from whence they are returned, in the form of pellets, to the mouth, where they undergo thorough mastication, and are then returned, as a pulp, by the esophagus directly into the third stomach. The direction of the food into one or other of these cavities is altogether independent of the will, and results from a peculiar arrangement and property of the lower end of the esophagus, which does not terminate at its opening into the paunch on one side, and the second stomach on the other, but is continued onwards as a deep groove or semi-canal, with two lips. If these lips come in contact, they form a perfect canal, leading directly to the third stomach; while if they remain open, the food passes into the first or second stomach. The dry food first swallowed opens the lips and escapes into the paunch, while the masticated food, being soft and pulpy, passes along the groove, without opening its lips, into the third stomach. Here it is diffused over a large surface of mucous membrane, and doubtless undergoes certain changes before entering the fourth or true stomach. In the camel, the dromedary, and the llama, numerous rows of large quadrangular deep water-cells are developed on the parietes of the second stomach, and on the part of the paunch next to that cavity. These cells are surrounded by muscular fibers, which, by their contraction, exclude the food from their interior, and by their gradual opening, the water is allowed to mix in successive small quantities with the food. It is by this arrangement that these animals only require to drink at comparatively long intervals. The intestinal canal of the ruminants is of great length, being sometimes, as in the sheep, more than thirty times the length of the body of the animal; and in herbivorous animals generally, as compared with carnivorous, the canal is very long.

It is in the large intestine that, next to the stomach, we find most varieties of structure. Cuvier has given the following *résumé* of the principal facts connected with this subject, to which, however, there are numerous exceptions: 1. In man, the orangs, and the wombats, there are both cæcum and vermiform appendix. 2. In the other quadrumana, the digitate carnivora, the marsupiata, the rodentia, the pachydermata, the ruminantia, the solipeds, and the amphibious mammals, there is a cæcum (often in vegetable-feeders larger than the stomach, and probably subservient to the digestive process), but no vermiform appendix. 3. In the odentata, the plantigrade carnivora, and the cetacea, there is neither cæcum nor vermiform appendix.

In birds, as in all other classes of animals, the alimentary canal varies according to the nature of the food, being long and capacious, and in some parts highly muscular, in the granivorous tribes, while it is much more simple in those which live on fish and other animal food. We take the common fowl as a good example of the former class. The esophagus, about the middle of its course, and a little above the union of the clavicles (the furculum), presents an enlargement termed the crop or *ingluvies*, which varies in form and structure according to the food, and is provided with numerous glandular follicles. Just before terminating in the gizzard, the esophagus again dilates to form a second but smaller cavity, known as the glandular stomach, *proventriculus*, or *ventriculus succenturiatus*, from whence a copious secretion of gastric juice is poured out and mixed with the food, which, having previously been macerated by the secretion of the crop, now passes on to the gizzard, which is a muscular organ of immense strength, which grinds and crushes whatever is placed in its central cavity—a process that is facilitated by the presence of hard pebbles, which are instinctively swallowed by the bird, and act the part of millstones. There is no very marked division in birds between the large and small intestine, the theoretical limit being indicated by the presence of two (sometimes only one) cæcal appendages.

There are no special points that we need notice regarding the digestive organs of reptiles, except that as the ophideans (serpents) and saurians (lizards) are mostly carnivorous, and most of the chelonians (tortoises) are herbivorous, the apparatus in question is more simple in the former than in the latter.

The amphibia afford us an excellent illustration of the close connection between the nature of the food and the development of the intestinal canal. In the young tadpole of the common frog, which lives upon the soft vegetable matter of our fresh-water ponds and ditches, the stomach is narrow and elongated, and the intestine is of extra-

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ordinary length, and of nearly equal diameter throughout, being coiled up in a spiral manner, and distending the capacious abdomen. As the tadpole becomes metamorphosed into a frog, it changes its vegetable food for slugs, worms, grubs, flies, etc., and, at the same time, the alimentary canal becomes very much shortened, and its divisions into stomach, etc., more distinctly marked.

In osseous fishes, the alimentary canal is generally shorter and more simple than in the higher vertebrata, in many—as, for example, the herring—being shorter than the body, and, excepting the stomach, running in nearly a straight line through it. In the cartilaginous fishes, as the sharks, rays, etc., a spiral valve winds in close turns from the pyloric to the anal extremity, leaving merely a small central aperture, along which the contents slowly progress. By this singular arrangement, the intestine, although short in proportion to the length of the animal, presents an enormous absorbing surface.

The limits within which we must confine this article preclude us from noticing the various modifications which the digestive organs present in the various departments of the invertebrate animals; and we shall conclude with a few remarks upon the mode in which digestion is carried on in some of the lowest and simplest animals. The *hydra* or fresh-water polype is a minute animal, consisting of nothing but a bag or stomach, with tentacles surrounding its single orifice. The animalcules, etc., which the hydra catches by these lasso-like tentacles (see HYDRA), are drawn into the interior, where they are digested, and applied to the nutrition of the organism, the insoluble portions being rejected by the aperture through which they entered. In the *actinophrys sol*, or sun-animalcule, there is no persistent aperture; but when its radiating filaments—from which it derives its name—have secured a particle of organized matter fit for its nourishment, they twist over it, compress it against the globular body, which first yields, and becomes concave at the point, and finally closes over it, the prey being distinctly visible in the interior. This astomatous animalcule can thus form a mouth and stomach when it requires them. The indigestible remains are ejected by a corresponding reverse process. The *amœbæ*, or *sponge-proteus* neither has a mouth and stomach, nor can it construct these organs: it simply folds itself around the solid particles from which it derives its nourishment, and imbibes their nutritious fluids through its cell-wall. We might adduce various other examples of animals devoid of a stomach, but we have brought forward sufficient evidence to show that the old doctrine, that this organ is a necessary constituent of an animal, cannot be sustained, when we approach that debatable-land which separates the two great organized kingdoms of nature.

DIGGES, an English family of note in the 16th and 17th centuries. LEONARD, d. 1573, wrote *Tectonicum*, briefly showing the exact measuring and speedy reckoning of all manner of lands, squares, timbers, stones, steeples, etc.; *Pantometria*, a practical geometrical treatise; and *Prognostication Everlasting of Right Good Effect, or Choice Rules to Judge the Weather by the Sun, Moon, and Stars.* THOMAS, son of Leonard, was an Oxford graduate, and a soldier. He wrote on mathematics and astronomy. Sir DUDLEY, son of Thomas, was the author of *Rights and Privileges of the Subject*, and the *Compleat Ambassador*. His son DUDLEY, d. 1642, was the author of *Unlawfulness of Subjects taking up Arms against their Sovereign.*

DIGGING. The operation of digging is performed with a spade or pronged fork. The spade or fork is thrust in with the foot, and the mass of earth is first loosened by the lever-power of the handle, then lifted and inverted. When this operation is performed in spring or summer, the ground should be dry, so as to obtain pulverization as easily and to as great extent as possible. In stronger soils, which are dug in autumn, a little moisture is desirable, as the land lies fallow, and the frosts of winter afterwards pulverize and reduce it to a proper degree for receiving the crops in spring. Digging is almost entirely confined to the cultivation of gardens, for though a most efficient means of cultivating the soil, it is too expensive for field-crops. It is almost always resorted to, however, in this country for digging over or trenching land which has been in timber, or full of stones or bowlders. Until recently, the spade was the only implement used for digging in gardens, but steel forks are now very extensively used, being lighter and more easily driven into the soil. Besides preparing the land for plants, the spade and the fork, chiefly the latter, are used for taking crops, such as potatoes and carrots, out of the ground.

DIGIT (Lat. *digitus*, the finger), a term applied to the ten symbols of number, 0, 1, 2, etc., to 9; thus, 305 is said to be a number of three digits. Numbers were originally indicated by the fingers, and hence the name. Astronomers use digit to signify a twelfth part of the diameter of the sun or moon, and speaks of an eclipse of seven digits, meaning that seven twelfths of the diameter is covered.

DIGITA'LINE is an active principle present in *digitalis purpurea*, or foxglove.

DIGITA'LIS, a genus of plants of the natural order *scrophulariaceæ*, natives chiefly of the s. of Europe and temperate parts of Asia. One only, the common FOXGLOVE (*D. purpurea*), is a native of Britain, and is very abundant in some parts of the country, its large purple flowers often giving a gay appearance to dry banks and steep hills. It is not unfrequently admitted into flower-gardens, particularly a white-flowered variety.

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Its English name, and the botanical name D. (Lat. *digitale*, the finger of a glove), both refer to the form of its flowers. The central and southern parts of Europe produce several species with yellow flowers, one of which, *D. grandiflora*, is not an uncommon ornament of gardens. *D. purpurea* is much valued in medicine. It was first brought into repute by Dr. Withering. Its leaves and seeds are the parts used, generally the former. They are narcotic and poisonous. The leaves have a disagreeable smell when fresh, and a bitter nauseous taste, and are violently emetic and cathartic; but when dried and administered in small and repeated doses, they are diuretic, and therefore sometimes useful in dropsy; and are still more valuable on account of their sedative power over the action of the heart and the circulation of the blood, and are used in diseases of the heart, aneurisms, hemorrhages, etc. They appear also to possess some peculiar power over the brain and nervous system, and have been employed in insanity, epilepsy, and other diseases. They are administered generally in the form either of tincture or infusion. They ought to be collected before the flowers expand. They owe their active properties to a peculiar crystalline principle called *digitaline* (q.v.). The use of D. as a medicine requires great caution on account of a property which it possesses—very remarkable in a vegetable medicine—of cumulative action on the system. Many if not all of the species of D. appear to possess similar properties with *D. purpurea*. See illus., FLOWERS, vol. VI.,

DIGITA'RIA. See MILLET.

DIGITIGRA'DA (Lat. finger-walking), in the zoological system of Cuvier, one of the tribes of the *carnivora* (q.v.), distinguished by walking on the toes alone, the heel not touching the ground. Among the digitigrade quadrupeds are included the most carnivorous of the *carnivora*, the feline and canine families, hyenas, civets, weasels, etc. The weasel family (*mustelidæ*), however, forms a connecting link, in respect to the character derived from the mode of walking, between the tribe D. and the tribe *plantigrada* (q.v.), being, in fact, semi-plantigrade, and not walking on the mere tips of the toes, like the other digitigrada.

DIGITORIUM, an apparatus invented by Myer Marks to exercise and strengthen the fingers. It consists of a small box, with five keys having resisting springs. It is also provided with appliances for the wrist and for stretching the fingers. It belongs to the catalogue of dumb-pianos, of which Schumann said in 1847: "There have been invented so-called dumb-keyboards. . . . One cannot learn to speak from the dumb."

DIGNE (Lat. *Dinia*), a t. in the department of the Basses-Alpes, on the Bleonne, 60 m. n.e. of Marseilles, occupies a picturesque situation upon a mountain slope, and is encircled by walls, but its streets are narrow, crooked, and steep, and the houses mean and squalid. It contains a cathedral and a public library. Among its chief manufactures are articles of leather, and it has a trade in dried fruits, honey, wax, woolen and linen cloth, kid-skins, etc. In the neighborhood there are several hot saline springs, temperature 104° F. Pop. of commune, '91, 7,261. Of Dinia, which is mentioned by Pliny, nothing remains. It is known that it embraced Christianity at an early period, and has given title to a bishop since the year 340. In the year 1629, a plague reduced the population of D. from 10,000 to 1500.

DIGNITARY, in canon law, originally signified an ecclesiastic of superior rank than a priest, such as bishop, dean, etc.; it now includes also canons and prebendaries.

DIJON, a t. of France, in the department of Côte d'Or, formerly capital of the old duchy of Burgundy, in lat. 47° 20′ n., and long. 5° 2′ e., and about 195 m. s.e. of Paris by railway. D. occupies a most delightful situation in a fertile plain on the right bank of the Ouche, and at the base of the vine-clad hills which produce the famous Burgundy wines. The environs are exceedingly beautiful. D. is surrounded by old walls, originally having but five gates, and the ramparts being tastefully planted with fine trees, furnish very agreeable promenades. The town is for the most part well and regularly built, and the streets spacious and clean. Among the public buildings, which are numerous and imposing, the chief are the cathedral, a massive Gothic structure, dating from the 13th c., with a tall wooden spire, above 300 ft. high; the church of Notre Dame, a noble specimen of the purest Gothic architecture; the church of St. Michael, with a splendid renaissance front; the theater, a handsome building, with a fine Corinthian portico; and the palace of the dukes of Burgundy, now used as the town-hall, and much modernized externally, but possessing interiorly some of its earlier features, and containing a museum very rich in monuments of the middle ages, besides a library of many thousand volumes, and several hundreds of manuscripts. D. is also the seat of a university academy with three faculties—law, science, and letters—and possesses, in addition, a royal college, a theological seminary, a botanic garden, and an academy of art. The manufactures of D. consist of woolen cloth, blankets, hosiery, leather, vinegar, chemical products, etc.; and there are salt refineries, distilleries, and breweries; but the town is mainly dependent on its trade in the wines of Burgundy. Pop. '96, 67,736. D. dates from Roman times, its ancient name being *Dibio*. It came into the possession of the Burgundians in the 5th c., and from them passed to the Franks. In the 9th c., it was ruled by counts of its own, under the suzerainty of the bishops of Langres. In the 11th c., it was united to the duchy of Burgundy, of which it became the capital, and the usual

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residence of the dukes, who rebuilt and greatly enlarged and improved it. In Oct., 1870, after a sharp engagement before the city, D. capitulated to a German force. There was again severe fighting here in Jan., 1871.

DIKAMAL'LI, a gum-resin which exudes, in amber-colored transparent drops, from the ends of young shoots of *gardenia* (q.v.) *lucida*, an Indian tree. It has a very powerful fragrance, and has been found extremely useful in hospitals, in keeping away flies, and especially as a dressing for wounds and running sores.

DIKE. See DYKE.

DIKE, in geology. See DYKE.

DIKOWA, or DEEGOA, a large t. of Bornu, Central Africa, about 30 m. s.w. of lake Tchad. It is in a great cotton growing district, and is a place of considerable trade. The spinning and weaving of cotton are also extensively carried on. The houses are mostly of clay, but each has its court-yard. Pop. supposed about 30,000.

DILAPIDA'TION, in English law, is where an incumbent suffers his parsonage-house or outhouses to fall down, or be in decay, for want of necessary reparation; or pulls down or destroys any of the outhouses or buildings belonging to his living; or destroys woods, trees, etc.; for it is said to extend to committing or suffering any willful waste on the inheritance of the church.—Stephens' *Eccl. Law*. D. is a species of the legal injury known as waste (q.v.). A rector or vicar is bound to keep his residence and the chancel of the church in repair, but not to supply or maintain anything in the way of ornament, as painting, white-washing, or papering. An ecclesiastical person suffering the church-property to get out of repair, is subject to an action for D. at the instance of his successor (13 Eliz. c. 10, s. 2); and by 14 Eliz. c. 11, s. 18, the money so recovered must be applied to the repairs. By 5 and 6 Vict. c. 108, s. 19, being an act to empower ecclesiastical corporations to grant long leases, it is provided that the incumbent shall not be liable for D. occurring during such leases.

DIL'ATORY PLEAS. See PLEA.

DILEMMA. A true D. is defined by Whately as "a conditional syllogism with two or more antecedents in the major, and a disjunctive minor." The following D., of the kind called destructive, will perhaps convey a clearer notion than any definition: "If this man were wise, he would not speak irreverently of Scripture in jest; and if he were good, he would not do so in earnest; but he does it, either in jest or earnest; therefore, he is either not wise or not good." There being two conclusions, one or other of which your opponent must admit, he is in a manner caught between them; hence we speak of the *horns* of a dilemma.

DILETTANTÉ (pl. *dilletanti*, Ital.), in its original sense, is synonymous with an *amateur*, or lover of the fine arts. It is often used as a term of reproach, to signify an amateur whose taste lies in the direction of what is trivial and vulgar, or of a critic or connoisseur whose knowledge is mere affectation and pretense. It is sometimes assumed, in a spirit of self-depreciation, by those who are unwilling that their critical acquirements or artistic productions should be judged by the rules which would be applied to those of persons who had made a professional study of art. It was in this sense that it was assumed by the Dilettanti Society (q.v.).

DILETTANTI SOCIETY, a body of noblemen and gentlemen by whose exertions the study of antique art in England has been largely promoted. The society was founded in 1734, and held its meetings at the Thatched House tavern in St. James' street. It was in its beginnings simply an amateur club, its object being to combine social and friendly intercourse with the cultivation of artistic knowledge and the gratification of artistic tastes. But its funds having accumulated to a large amount, its members resolved, in 1764, to fit out an expedition for the purpose of collecting details and drawings of the most remarkable artistic monuments of antiquity. The persons selected for carrying out this important undertaking were Mr. Chandler, of Magdalen college, Oxford, the editor of the *Marmora Oxoniensis;* Mr. Revett and Mr. Stewart, the authors of the magnificent work on Athenian antiquities; and Mr. Pars, a talented young artist. Having spent two years in Greece, they returned in 1766, bringing with them the materials for the two splendid volumes on the antiquities of Ionia, which were published at the expense of the society. Architecture had been the first object of their inquiries, but their attention was now turned to sculpture, which was then at the lowest ebb in England. A series of the finest antique statues, bas-reliefs, and busts were selected and engraved with the greatest care. This work appeared in 1809, with dissertations by Payne Knight. In 1811, a second architectural exploring-party was dispatched by the society to Asia Minor, consisting of Mr. (afterwards sir William) Gell, Mr. Bedford, and Mr. Gandy. Two volumes were issued, one in 1817 entitled *The Unedited Antiquities of Attica*, and a second on *Antique Sculpture* in 1835. For these spirited exertions in their behalf, the public have been indebted to a club of some sixty private gentlemen.

DILIGENCE, the name given in France to a public conveyance of the nature of a stage-coach It is a huge, strong-built vehicle, with four broad wheels, weighing about 5 tons, and is drawn by 4 stout horses, at the rate of about 6 miles an hour. It consists of 3 chief compartments: the front, called the *coupé*, for 3 persons; the second, called

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the *intérieur*, for 6 persons; and, lastly, the *rotonde*, entered from behind, for 6 persons. Aloft, in front, is the *banquette*, where the *conducteur* is seated; and behind this, underneath a thick leather covering, passengers are sometimes huddled among luggage and goods, with little regard to their comfort. All the places in the body of the vehicle are numbered, and assigned in the order of booking. Usually an effort is made to be booked early, in order to secure corner-places. In booking, it is customary to pay only a portion of the fare, called *arrhes;* the remainder being paid at the end of the journey. For the arrhes, a receipt or bulletin ought to be given. Without this security, a traveler may be put down half-way and cheated out of his fare, or he may be compelled to pay over again. The driver being concerned only with the horses, the entire management of the vehicle, including the charge of the drag or break, devolves on the conducteur, a trustworthy but most dictatorial personage, dressed in a blue cloth jacket and cap, and having a badge on his breast indicative of his dignity. The greater number of the diligences in France belong to two companies in Paris—the *Messageries Impériales* and the *Messageries Générales*. The system of diligences, however, has been latterly much broken up by railway transit.

DILKE, Sir CHARLES WENTWORTH, 1810–69; a native of London, educated at Cambridge. He assisted his father, the editor of the *Athenæum*, in literary work, and gave much attention to the learned societies. He was a zealous promoter of the great exhibition of 1851, at the close of which the queen offered him knighthood, which he declined. He was one of the English commissioners to the New York exhibition of 1853, and prepared the report upon it. He was also one of the five royal commissioners for the exhibition of 1862. In 1865, he was a member of parliament, and in 1869, representative of England at the St. Petersburg horticultural exhibition. He was knighted by the queen soon after the death of the prince consort.

DILKE, Sir CHARLES WENTWORTH, born 1843; son of the preceding; an English politician, author, and lawyer; educated at Cambridge. He has traveled extensively in the United States, Canada, and the British countries in the east, and embodied his observations in *Greater Britain; a Record of Travel in English-speaking Countries during* 1866–67. In 1868 he was chosen a member of parliament; re-elected for Chelsea, '80 under sec. of state for foreign affairs. He was editor of the *Athenæum*, and of *Notes and Queries*. In 1891 he published *Problem of Greater Britain*. He retired from public life in 1888, but re-entered parliament in 1892; re-elected in 1895.

DILKE, MARGARET MARY, eldest daughter of T. Eustace Smith, was born in 1857. In 1876, she married Ashton W. Dilke, who died nine years later. Since 1878 Mrs. Dilke has been an active worker for woman's suffrage. She has also helped to promote various schemes for improving the position of women and workingmen. Beside delivering many lectures and speeches on woman suffrage she also wrote a volume on the subject, in 1885. The *Weekly Dispatch* has been under her control since 1888.

DILL, *Anethum*, a genus of plants of the natural order *umbellifera*, having compound umbels without general or partial involucres, the border of the calyx minute but 5-toothed, yellow involute petals, and dorsally compressed lenticular fruit. The COMMON D. (*A. graveolens*) is an annual or biennial plant, which grows wild in corn-fields in the east and in the countries around the Mediterranean, but is quite hardy in Britain. It has from a very early period been in general cultivation as an aromatic, stimulant, and carminative. It has a stem 1 to 4 ft. high, bearing at top a flat umbel of 10 to 30. rays; the leaves much divided, and the final segments thread-like. It has a strong peculiar aromatic smell and taste; the leaves are sometimes used for flavoring pickles, sauces, etc. The fruit (*dill seed*) is used in medicine, chiefly for relief of flatulence and griping in infants, and is administered in the form of *dill water*, in the preparation of which *oil of dill* is employed; a pale-yellow essential oil, on which the properties of the plant depend, and which is obtained by distillation.—SOWA D. (*A. sowa*) is a native of Bengal, and is much cultivated in the East Indies for its fruit, which is variously used in medicine and flavoring. It is a common ingredient in curries. The plant much resembles common D., but its flavor is stronger.

DILLEN or **DILLENIUS**, JOHANN JAKOB, 1687–1747; a German botanist, educated at Giessen. He went to England in 1721, and was a co-laborer with William Sherard, the most eminent English botanist of the time. In 1728, he was appointed professor of botany at Oxford. He wrote many works upon his favorite themes, some of which received high praise from Linnæus.

DILLENIA'CEÆ, a natural order of exogenous plants, consisting chiefly of trees, shrubs, or half-shrubby plants, natives of tropical and subtropical regions, allied to the natural order *ranunculaceæ* (q.v.), but very different in general habit, and also to *magnoliaceæ*, which in habit they more resemble. They have usually alternate leathery leaves, without stipules. The flowers are sometimes solitary, sometimes in racemes or panicles; the calyx of 5 persistent sepals; the corolla of 5 deciduous petals. The stamens are numerous. The fruit consists of 2 to 5 distinct or coherent, dry or succulent, carpels. The seeds have an aril. Astringency is a general property of the order; and a number of species are used as vulneraries and for other medicinal purposes in their native countries. Some species of *dillenia* are large trees, and afford excellent timber.

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The young calyces of *D. scabrella* and *D. speciosa* have a pleasant acid taste, and are used in curries, and the fruit of *D. speciosa*, although very acid, is eaten with sugar; the juice, mixed with water, is employed in India as a cooling beverage in fevers. The fruit of *D. elliptica* is used to make a sauce for fish in Amboyna. Many of the plants of this order are remarkable for the magnificence both of their foliage and their flowers. It contains about 200 known species.

DIL'LINGEN, a t. in Bavaria on the Danube, 24 m. n.w. of Augsburg; pop. '90, 5734. Its principal buildings are the royal palace, the royal gymnasium and Latin school, two Episcopal seminaries, a Capuchin monastery, a Franciscan nunnery, a deaf and dumb asylum, and some fine churches. The principal occupations are shipbuilding, the shipping trade, and the manufacture of paper, cloth, and cutlery. The place was taken by the Swedes in 1632 and 1648, the Austrians 1702, and the French 1800.

DILLMANN, CHRISTIAN FRIEDRICH AUGUST; b. 1823; a native of Würtemberg, educated at Tübingen. In 1854, he was appointed professor of oriental languages at Kiel, and in 1864, he accepted a call as professor of theology at Giessen. In 1869, he succeeded Hongstenberg in the university of Berlin, as professor of Old Testament exegesis. He is noted chiefly for researches in the Ethiopic language, of which he has published a grammar, dictionary, and other works. He published a *Commentary on Exodus and Leviticus*, 1880; and one on *Genesis*, 1882. He was pres. of the fifth international oriental congress, 1881, and published their proceedings.

DILLON, JOHN, the son of John Blake Dillon (1816–66), who was a prominent member of the Young Ireland party, and member for County Tipperary in 1865–66. Born in New York in 1851, he was educated at the Catholic University of Dublin, after which he became a doctor. He early identified himself with the Parnellite movement, and in 1880 was returned for County Tipperary. In the House of Commons Dillon soon became prominent for the violence of his language, while speeches delivered by him in Ireland led to his imprisonment in 1881, 1881–82, 1888, and 1890–1. From 1883 to 1885 he was absent from political life on account of ill-health; but in the latter year he was elected for East Mayo; re-elected in 1892 and 1895. He was an active promoter of the "Plan of Campaign" (q. v.), and succeeded Justin McCarthy as chairman of the Irish party in 1896.

DILUENTS (Lat. *diluo*, I dilute), medicines whose purpose is to dilute the blood, and increase the quantity of the excretions generally. The simplest and best of diluents is water; but all watery fluids, such as lemonade, soda-water, beer, infusions or ptisans, tea, etc., may be regarded as coming under this designation. See DEMULCENTS.

DILU'VIUM, a term formerly given by geologists to those strata which they believed to have been formed by the deluge, and more particularly to the bowlder clay. The altered opinions as to the origin of these beds have caused the word to fall into disuse. When the adjective—diluvial—is employed by modern writers, it is to characterize those accumulations of gravel or angular stones which have been produced by sudden or extraordinary currents of water.

DIME. In the United States, a silver coin whose value is ten cents—that is, one-tenth of a dollar. It is derived from the Latin *decimus*, through the Old French *disme*, and Middle English *dyme* or *disme*. Compare the Modern French *dime*, a tenth.

DIMENSION. In geometry, a line, whether straight or curved, has only one dimension, or measurement—namely, length; a surface has two—length and breadth; and a solid has three dimensions—length, breadth, and thickness, or depth. These three measurements or dimensions determine all forms of extension.—In algebra, the term dimension is applied in much the same sense as *degree*, to express the number of literal factors that enter into a term. Thus, x^2, xy, $2ab$, are all of two dimensions, or of the second degree; x^3, x^2y, abc $\frac{a^2bc}{d}$, are of three dimensions, etc.

DIMENSION, FOURTH. Length, breadth, and thickness have thus far been found sufficient to determine all known forms of extension. Hence space is usually regarded as tri-dimensional. However, the possibility of the existence of space having more than three dimensions has been much discussed. Since points, lines, and surfaces in general generate by their motion lines, surfaces, and solids respectively, it is held that the generation of a fourth dimensional figure by one of three dimensions is conceivable. The subject, though interesting, is wholly speculative.

DIMIDIA'TION, in heraldry, a mode of marshaling arms, adopted chiefly before quartering and impaling according to the modern practice came into use, and subsequently retained to some extent in continental though not in English heraldry. It consists in cutting two coats of arms in half by a vertical line, and uniting the dexter half of the one to the sinister half of the other. Coats of husband and wife were often so marshaled in England in the 13th and 14th centuries.

DIMINUENDO (Ital. diminishing), a term in music, having reference only to the power of the sound, and in no way affecting the *tempo*, as many think. D. can be applied to a single note, when it is a long note, as well as to a passage of many notes. D. is so nearly of the same meaning as decrescendo, that it is frequently marked with the same sign, thus 

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DIMINU'TIONS, a word sometimes used in heraldry for differences, marks of cadency, and brisures, indifferently.

DIMINUTIVES are forms of words, chiefly of substantives, in which the primitive notion has become lessened or diminished, as *hillock=a little hill*. With littleness is associated the idea of neatness, and also of needing protection; hence D. are used as terms of endearment; sometimes they imply contempt. There is perhaps no language without D.; and the most common method of formation is by the addition of a syllable. This, however, is not the only method; *tip* from *top*, by attenuating the vowel, and *kid* from *goat*, are as genuine D. as *hillock*. The commonest of the English diminutive affixes are *ock*, *kin*, *el* or *le*, which are of Gothic origin, and *et* or *let*, of classical origin; as in *bullock*, *lambkin*, *kernel* (little corn), *lancet*. According to Dr. Latham, the termination *ling*, or rather *ing*, was originally patronymic; "Ida was the son of Eoppa," was expressed in Anglo-Saxon by *Ida wæs Eopping*. From the notion of the filial relation, the transition is easy to that of littleness and endearment, as in *darling*, *duckling*. Contempt predominates in *shaveling* (a monk) and others.

D. often occur in proper names; *Perkin* is the diminutive of *Peter*, *Jenkin* of *John*. These have settled down into permanent and distinct names; but in the language of fondness and familiarity, *Charles* becomes *Charley*, *John*, *Johnny*, etc. In Lowland Scotch, this form of diminutive is not confined to proper names, but is applied to every object, animate or inanimate—*laddie*, *horsie*, *wifie*, *firie*. Sometimes one diminutive affix is joined to another, as *lassock*, *lassockie;* and in expressions like *a wee*, *wee bit horsikie*, the diminution is carried to the fifth degree. It is principally in the mouths of the people and in friendly familiarity that these diminutive forms are most common; and some languages and dialects are rich in them beyond others. Italian is remarkable in this respect, especially the Tuscan dialect: *casa*, house, becomes *casarella*, little house, and *casarellina*, pretty little house; from *fratello*, brother, which is itself a diminutive of the Lat. *frater*, children, it is said, may be heard forming such fond names as *fratellinucciettinetto*. The affectionateness and bonhomie of the Germans expresses itself largely in this form; *vater*, father, becomes *väterchen*, dear father; and even the pronoun *du*, thou, is made into *duchen*, and *duli*.

D. are not confined to nouns: *whitish* is the diminutive of the adjective *white;* and *tipple*, *scribble*, *dandle* are examples of diminutive verbs. Opposed to D. are AUGMENTATIVES, which abound in the Romanic languages, especially in Italian, and express not only largeness, but coarseness and vulgarity; *casotta* is a large house; *cavallaccio*, a worthless horse. Our word *balloon*, which is of foreign origin, is of this form, and means a large ball. Such words as *drunkard*, *braggart*, *buzzard*, seem to be genuine English augmentatives.

DIMITY, a stout figured cotton-fabric, used chiefly for bed-hangings. The figure or stripe is raised on one side, and depressed on the other, so that the two faces present reversed patterns. D. is commonly white, or of a single color; but variegated dimities are now made, the pattern and the ground being of different colors.

DIMMIT, a co. in s.w. Texas, traversed by the Nueces river. It has excellent pasturage and large numbers of cattle are reared. Pop. '90, 1049.

DIMORPHOUS (Gr. *dis*, twice; *morphe*, shape or form) is the term applied to a substance when it exhibits the property of crystallizing in two distinct forms or systems. See CRYSTALLOGRAPHY. Thus, sulphur, as found crystallized naturally, and as obtained by the spontaneous evaporation of its solution in bisulphuret of carbon, or in chloride of sulphur, presents itself in crystals of the form of octohedra, with a rhombic base, and thus belongs to the *prismatic system;* but when sulphur is heated to fusion, and then slowly cooled, prismatic crystals of an amber color are obtained, which belong to the *oblique system*. The latter form of sulphur is not permanent, and the crystals gradually become opaque, and pass into the form of numberless octohedra. In their turn, the octohedral crystals, when kept at a temperature of 230° F. for some time, pass into the prismatic form. Carbon is another illustration of *dimorphism*. Thus, carbon crystallizes in the diamond in the regular system as the octohedron and allied forms; while in the condition of graphite or black lead (q.v.), as obtained by the cooling of its solution in fused cast-iron, it is in the form of hexagonal crystals belonging to the rhombohedral system. Carbonate of lime and iodide of mercury are also good examples of dimorphism; and some substances, such as the sulphate of nickel, sulphate of zinc, seleniate of nickel, and the seleniate of zinc, crystallize in three different systems and are thus *trimorphous*.

DI'NABURG. See DÜNABURG.

DINAGEPORE', or DINAJPUR, the district of the below mentioned city, stretches in n. lat. from 24° 53′ to 26° 38′, and in e. long. from 88° 2′ to 89° 16′, containing 4118 sq. m. and '91, 1,556,000 inhabitants. The country is flat, its only eminences being mere undulations; and, from the proximity of the Himalayas, the whole tract is little but a network of water-courses, many of the channels, however, becoming periodically dry. The winds are more variable than is usual elsewhere in India, and hailstones are occasionally of such weight as to kill men and cattle. Rice is the principal crop, and fish are singularly plentiful.

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DINAGEPORE', or DINAJPUR, capital of the district of D. in the province of Bengal, with ('91) 12,200 inhabitants, stands 261 m. to the n. of Calcutta, in lat. 25° 34′ n., and long. 88° 38′ east. It is watered by an offset of the Attree, called the Purnabada, which, through the Mahanunda, enters the Lower Ganges from the left.

DINAN, a very old t. of France, in the department of Côtes-du-Nord, on the Rance, 30 m. n.w. of Rennes, and 14 s. of St. Malo. The situation of D. on the summit of a steep hill of granite, and with the Rance flowing through a valley 250 ft. below, is romantic in a high degree. It is surrounded by old walls, pierced by four gates, and was formerly defended by a strong castle, part of which has been converted into a prison. In the older district, the streets are crooked, narrow, and steep, many of the buildings being crazy constructions of wood; but in some parts, its overhanging houses, and arcades resting on carved granite pillars, present many picturesque architectural features, attractive to the antiquary and the artist. The cathedral of St. Sauveur is a beautiful ornate edifice, built in the Romanesque style, containing the heart of the famous French warrior Bertrand du Guesclin. D. has manufactures of fine linen and of sail-cloth, of cotton and woolen goods, beet-root sugar, etc. It has also some barge-building yards, and, owing to its position near the mouth of the Rance, has a good coasting and inland trade. Population, '91, 10,444. A few miles off lies the village of Corseult, built on the ruins of the capital of the ancient Curiosolitæ. In the fields round about the village are still occasionally found ancient utensils, Roman coins, and traces of a temple dedicated to Mars.

DINANT, a t. of Belgium, in the province of Namur, 14 m. s. of the city of that name. It is situated on the Meuse in the midst of extremely picturesque scenery. The most noteworthy buildings of D. are the church of Notre Dame, an ancient and richly decorated Gothic structure, and the town-house, once the palace of the princes of Liège. D. has several salt-refineries, mills for sawing marble, some quarries of which are worked in the vicinity, paper-mills, breweries, and tanneries. It has also manufactures of woolen stuffs, paper, hats, cards, and cutlery. The gingerbread of D., composed of rye-flour and honey, is famous, and has an extensive sale. Pop. '90, 7,048. D., which dates from the 6th c., has suffered greatly from frequent sieges. In 1466, Philip, duke of Burgundy, attacked it with a strong force, and, when the town was taken, in retaliation for the hanging of the messengers whom he had sent to summon the town to surrender, he ordered 800 of the inhabitants to be tied in couples, back to back, and cast into the Meuse. At this time, also, the town was burned, and the walls leveled.

DINAPORE', an important military station in the Indian province of Behar, stands on the right bank of the Ganges, 10 m. above Patna, in lat. 25° 37′ n., and long. 85° 7′ east. It contains spacious barracks. Its population in 1891 numbered 44,400. In the mutiny of 1857, D. acquired an unenviable notoriety. On the 25th of July, nearly eleven weeks after the commencement of the outbreak, the native troops, consisting of three regiments, rose against their officers, and that in the presence of a European force, which, if well handled, was as able as it was ready to crush them. After escaping with comparatively little loss, the insurgents, clinging instinctively together, carried on a desultory warfare on their own account with various success. See ARRAH.

DINAR, one of the so-called Kufic coins; of gold, with a value of about 10s. 8d., or about $2.60. The name itself is a corruption of the Latin *denarius* (q. v.).

DINAR'CHUS, the orator, son of Sostratus, b. Corinth, 361 B. C. At 25 he was a writer of speeches for the law courts. He had been a pupil of Theophrastus, and early gained oratorical repute. In 324 B. C., he wrote three or more of the speeches in the case of the prosecution of nine men for taking bribes from Harpalus, the fugitive treasurer of Alexander. The speeches were "Against Demosthenes," "Against Aristogiton," and "Against Philocles."

DINARIC ALPS, that branch of the Alpine system which connects the Julian Alps with the western ranges of the Balkan. It extends in a south-easterly direction, from Mt. Klek, e. of Fiume, to the mouth of the Narenta; and, stretching along the borders of the Adriatic, it spreads its ramifications through the greater part of Croatia, Dalmatia, and Herzegovina. The D. A., the highest summits of which are Mt. Dinara and Mt. Prolok, seldom exceed 7,000 ft. in height. The range is principally calcareous.

DINDIGUL', a t. of India, in the British district of Madura, presidency of Madras, at the extremity of a valley of the same name, on a feeder of the Cauvery, 247 m. s.w. of Madras city. It is 700 feet above the level of the sea, and built on a gentle declivity; the streets are wide, the houses well built, and the bazaar plentifully supplied. The population in 1891 was 20,200, exclusive of the military. The fort is situated on a wedge-shaped mass of gneiss, which rises to a height of 280 ft., perfectly naked, except near the summit, where some stunted trees and shrubs grow on patches of thin soil. The ascent is on the eastern side by a flight of stone steps.

DINDORF, WILHELM, b. 1802; a German critic and philologist. He was a zealous student of classical literature, and became professor of literary history. Dindorf published critical editions of Demosthenes, Aristotle, Sophocles, Euripides, and Josephus. His editions are held as high authority. He d. 1883.

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DINGELSTĒDT, FRANZ VON, b. 1814; a German poet, native of Hesse. In 1848, he was librarian to the king at Stuttgart; became superintendent of the royal theater at Munich in 1850, director of the court opera at Vienna in 1867, and director of the city theater there in 1871. His early poems were mainly political. At a late period he wrote *Night and Morning*, and the *House of Barneveldt*, a tragedy. He married Jenny Lutzer, a famous singer. He d. 1881.

DINGLE, a seaport, the most westerly town in Ireland, is situated in co. Kerry, in a hollow on the n. side of Dingle bay, near the west end of a mountainous peninsula (30 m. by 7), 39 m. w.n.w. of Killarney. It chiefly consists of one street, and has an antique aspect, some of the present houses having been built in the 16th c., in the Spanish style, with stone balconies, etc. Pop. abt. 2000. The chief exports are corn and butter to Liverpool. D. was incorporated in 1585. In the 17th c., it had much trade with Spain, exchanging tanned hides, Irish friezes, woolen stockings, salt beef, salmon, and butter, for wines and spices. Dingle bay is an indentation of the sea.

DINGLEY, NELSON, Jr., b. Me., 1832; graduated at Dartmouth college, 1855; assumed the editorship of the *Lewiston Journal*, 1856, which he retains. He was a member of the Maine legislature for a number of years; governor of that state, 1874–5; and a member of Congress since 1881. As chairman of the committee on ways and means, he had charge of the tariff bill of 1897.

DINGO, *Canis dingo*, the native dog of Australia, regarded by some naturalists as a distinct species, by others as a mere variety of *canis familiaris*. It exists both in a wild and in a domesticated state; but there is no good reason for thinking that the wild race has originated from dogs introduced from some other country by man. The domesticated D. is about the size of a shepherd's dog, the wild one is larger. The wild D. is found in all parts of Australia. It is of a tawny color, has a large head, with muzzle somewhat fuller than the shepherd's dog. The ears are short and erect, the tail bushy, but not so bushy as that of a fox. In running, the D., unlike dogs in general, carries the head high, the ears erect, and turned forward. In a wild state, it does not bark. It is very destructive to the sheep of the colonists, and its delight is to kill as many as possible before proceeding to eat. It is very fierce and courageous, but capable of strong attachments.

DINGWALL, a royal and parliamentary burgh, the county town of the united counties of Ross and Cromarty, in the s.e. of Ross-shire, at the head or s.w. end of the Cromarty firth, 11 m. n.w. of Inverness. In Scandinavian, D. means law or court hill; and in Gaelic, it is called Inverpheoran. It consists chiefly of a long street, and lies low, on what was formerly a swamp, amid rich, fertile, and well-wooded ground, at the entrance to the beautiful valley of Strathpeffer, the famous sulphureous springs of which are five miles to the west. A short canal brings vessels drawing 9 ft. of water up to the town, where there is a station of the Highland railway, and also of the Dingwall and Skye railway. Its prosperity depends on agriculture. Pop. '91, 2283. It unites with Tain, Dornoch, Wick, Kirkwall, and Cromarty in sending one member to parliament. Near to D. is a vitrified fort, on a conical hill, and there are traces of an ancient castle, where the earls of Ross held their courts.

DINICHTHYS (Gr., meaning "terrible fish"), the largest of the fossil fishes of the Devonian formation. Its body, according to Dr. Newberry, was 15 or 18 ft. long, and 3 ft. thick. The jaws were armed with two strong, sharp front teeth, and were also arranged at their joints in such a manner as to act like a pair of shears. This structure has a strong resemblance to the jaws of the lepsidosiren, a living fish, the nearest allied to the reptiles. The head and forepart of the body was covered with large plates.

DINKELSBÜHL, a t. of Bavaria, situated on the Wernitz, 44 m. s.w. of Nuremberg. It is an ancient walled town, and was formerly a free city of the empire. It has important manufactures of hosiery, coarse linen, straw-hats, paper, etc.; and a dye-work, brewery, and mills. D. suffered much during the thirty years' war. Pop. about 5000.

DINNER. See MEALS.

DINOCRATES, a Greek architect of the time of Alexander the great. He applied to the courtiers for an introduction to the Macedonian king, but was put off from time to time with vain promises. Impatient at the delay, he is said to have laid aside his usual dress, besmeared his body in oil in the manner of an athlete, thrown a lion's skin over his shoulders, and, with his head adorned with a wreath of palm branches, and a club in his hand, made his way through a dense crowd which surrounded the royal tribunal to the place where the king was dispensing justice. Amazed at the strange sight, Alexander asked him who he was. He replied that he had come into the royal presence to make known a scheme which would be worthy of the consideration of the greatest monarch in the world. Out on Mt. Athos, a mountain rising like a pyramid to a height of 6,780 ft., topped with a cone of white limestone, he proposed to construct the gigantic figure of a man, holding a large city in his right hand, while in his left he held a gigantic tank large enough to contain all the water from the brooks in the peninsula. The story goes that the king was not displeased with the idea, though thinking it impracticable. Alexander, however, was so delighted with the man, and his bold and

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daring conceptions, that he carried D. with him on his campaigns against Darius. He was employed by the king to design and lay out the city of Alexandria. The city was founded in 332 B.C., but the untimely death of D. prevented it from assuming the proportions intended by its designer. The Ephesians, whose temple of Diana had just been burnt down, employed him in its reconstruction. But perhaps the most original of all his conceptions was his design for a temple to Arsinoë, wife of Ptolemy II., king of Egypt. The roof of the building was to have been composed of a mass of loadstones, strong enough to hold floating in the air and suspended within the temple an iron statue of the queen.

DINOR'NIS (Gr. *deinos*, terrible or wonderful, and *ornis*, a bird), a genus of large birds of the tribe *brevipennes* (q.v.), of which no species is now known to exist, but of which the bones have been found in New Zealand, in the most recent deposits, in the sand of the sea-shore, in swamps, in the soil of forests, in river-beds, and in caves; and concerning which, along with other large birds nearly allied to them (*palapteryx* and *cptornis*), traditions are still current among the natives, rendering it probable that they continued to inhabit New Zealand, if not to the 18th, at least to the 17th century. The name by which these birds are known in the traditions of New Zealand is *moa*. They are said to have been decked in gaudy plumage, for the sake of which they were objects of pursuit, as well as for their flesh, which was much esteemed. They are also described as having been stupid, fat, and indolent birds, incapable of flying, living in forests and mountain-fastnesses, and feeding on vegetable food. With all this, the inferences deduced from their bones by comparative anatomists perfectly agree. These bones are not properly fossil or mineralized, but retain great part of their animal matter. It is even thought not impossible that some of the smaller species of D. may yet be found alive; of the larger ones, this can no longer be hoped. And these much exceeded in size any existing bird, some of the bones being at least twice the size of those of the ostrich; but the body seems to have been more bulky in proportion, and to have more resembled that of the dodo, although the legs were long, and *D. giganteus* must have stood at least ten feet and a half in height. The frame-work of the leg is the most massive of any in the class of birds, and the bones are remarkable for the solidity of their structure. The toe-bones of *D. elephantopes* almost rival those of the elephant.

The number of bones of D. which have been found is great; several species have been distinguished, and an almost complete restoration of skeleton has been effected. The first bone ever seen by a naturalist—a bone of the leg—was brought under the notice of Prof. Owen in 1839; and it is worthy of being borne in mind, that from that one bone he assigned to the D. its true place in the system of nature, and pointed out some of the most important characters which are now most fully proved to have belonged to it.

DINOSAU'RIA (Gr. terrible or wonderful lizards), an order of extinct lizards, which are found in the lias, oolite, and wealden, and disappear in the lower cretaceous beds. They were gigantic reptiles, with a structure approaching nearer to the mammalian type than any other of their class. Their bodies were supported, at a considerable height, on four strong limbs, and the sacrum was composed of five amalgamated vertebræ. The principal genera are megalosaurus (q. v.), iguanodon (q.v.), and hylæosaurus (q.v.).

DINOTHE'RIUM (Gr. terrible or wonderful beast), a remarkable extinct animal, the cranial bones of which are found in the miocene formations of Germany, France, etc. The animal was provided, like the elephant and the walrus, with a pair of long tusks; but these projected from the end of the lower jaw, which is deflected downwards, at a right angle to the body of the jaw. In addition to the two tusks, there were five double-ridged grinders on each side of both jaws. The nasal cavity is large, apparently supplying attachment for a trunk, as in the elephant. No body or limb bones have yet been found so associated with those of the skull, as to show that they belonged to the same animal. Hence the true position of the D. has not been satisfactorily determined. Cuvier and Kaup have referred it to the neighborhood of the tapir, supposing it to have been an inhabitant of large lakes. De Blainville, on the other hand, makes it a herbivorous cetacean, like the manatee.

DINWIDDIE, a co. in s.e. Virginia, between the Appomattox and Mottaway rivers, crossed by the Atlantic, Coast line, and the Norfolk and Western railroads; 529 sq. m.; pop. '90, 36,195, includes colored. It has a rolling surface and good soil, producing tobacco, corn, etc. Co. seat, Dinwiddie.

DINWIDDIE, ROBERT, 1690–1770; native of Scotland; lieutenant-governor of the Virginia colony, 1752–58; in the latter year he returned to England. He appointed Washington adjutant-gen. of one of the military districts of the colony, and also commissioned him to remonstrate with the French gen. on the Ohio, for invading British possessions. Dinwiddie's arrogance and peculiar ideas concerning his own importance made him very unpopular. When he left the country he was suspected of having appropriated for his own use $100,000 of the public money.

DIOCESAN is a bishop viewed in relation to his own clergy or flock.

DIOCESAN COURTS. See CONSISTORY and COMMISSARY.

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DI'OCESE (Fr., from Gr. *dioikesis*, administration; and *dioikeo*, to govern), the territory over which a bishop exercises ecclesiastical jurisdiction. The term occurs as early as the time of Cicero, as the special designation of districts in Asia Minor. In the organization of the Roman empire introduced by Constantine the great, the designation diocese was applied to the larger divisions, which were subdivided into provinces. About the middle of the 5th c., the dioceses of the empire were the East, Egypt, Asia, Pontus, Thrace, Macedonia, Dacia, Illyria, Italy, Africa, Gaul, Spain, and Britain. The dioceses were governed some by prefects, some by proconsuls, and others by vicars. The provinces were under rectors. The government of the Christian religion, as established by Constantine, was in so far adapted to this division, and the term diocese and others passed over to ecclesiastical matters. At first, a diocese meant the collection of churches or congregations under the charge of an archbishop. The name came afterwards to be applied to the charge of a bishop, which had previously been called a parish. England and Wales are divided ecclesiastically into two provinces, viz., Canterbury and York, the former being presided over by the primate of all England and the latter by the primate of England; each of which is subdivided into dioceses, and these again into archdeaconries, rural deaneries, and parishes. A diocese is synonymous with the see of a suffragan bishop. See BISHOP.

DIOCLETIA'NUS, VALERIUS, b. in humble life near Salona, in Dalmatia, 245 A.D., inherited from his mother, Dioclea, the name of Diocles, which he afterwards enlarged into D., and attached as a cognomen to Valerius, a name of the most patrician associations. He adopted a military career, and served with distinction under Probus and Aurelian, accompanied Carus on his Persian campaign, and finally, on the murder of Numerianus having been discovered at Chalcedon, he was proclaimed emperor in 284 by the army on its homeward march. The suspected assassin of Numerianus, the prefect Arrius Aper, he slew with his own hands, in order, it is alleged, to fulfill a prophecy communicated to him, while still a lad, by a Druidess of Gaul, that he should accede to a throne as soon as he had killed an *aper* (wild-boar). In 285, D. commenced hostilities against Carinus (the joint-emperor along with the deceased Numerianus), who, although victorious in the decisive battle that ensued, was murdered by his own officers, thus leaving to D. the undisputed supremacy. His first years of government were so molested by the incursions of barbarians, that, in order to repel their growing aggressiveness, he took to himself a colleague—namely, Maximianus—who, under the title of Augustus, became joint-emperor in 286. D. reserved for himself the charge of the eastern empire, and gave the western to Maximian. Still the attacks of the barbarians continued as formidable as ever. The empire was menaced by the Persians in the e., by the Germans and other barbarians in the w.; and in order to provide for its permanent security, D. subjected it to a still further division. In 292, Constantius Chlorus and Galerius were proclaimed as Cæsars, and the distribution of the Roman empire was now fourfold: D. taking the e., with Nicomedia as his seat of government; Maximian, Italy and Africa, with Milan as his residence; Constantius, Britain, Gaul, and Spain, with Trêves as his headquarters; Galerius, Illyricum, and the entire valley of the Danube, with Sirmium as his imperial abode. It was upon his colleagues that most of the burden of engaging actively in hostilities fell, as D. seldom took the field in person. Among the conquests, or rather re-conquests, that were made under his rule, may be enumerated that of Britain, which, after maintaining independence under Carausius and Allectus, was, in 296, restored to the empire; that of the Persians, who were defeated, and compelled to capitulate in 298; and that of the Marcomanni, and others of the northern barbarians, who were driven beyond the Roman frontier. D., after 21 years' harassing tenure of government, desired to pass the residue of his days in tranquillity. On the 1st of May, 305, accordingly, he abdicated the imperial throne at Nicomedia, and compelled his colleague, Maximian (much against the latter's will), to do likewise at Milan. D. sought retirement in his native province of Dalmatia, and for 8 years resided at Salona (see SPALATO), devoting himself to philosophic reflection, to rural recreation, and to horticultural pursuits. Two years before his abdication, he was instigated by his colleague, Galerius, to that determined and sanguinary persecution of the Christians for which his reign is chiefly memorable. He died in 313.

DIODA'TI, JEAN, a Swiss theologian, was b. in Geneva in 1576. He belonged to a noble Italian family, originally of Lucca. His progress in letters was so rapid, that Beza caused him to be appointed professor of Hebrew at the age of 21. In 1608, he became a pastor of the Reformed church, and in the following year, professor of theology. About this period, he endeavored to spread the doctrines of the reformation in Venice and other cities of Italy, but without success. In 1614, he went to Nîmes, where he preached for three years; and in 1618, he was sent to the synod of Dort, to represent the Genevese church. Here his talents were so highly estimated that he was one of the divines appointed to draw up the articles of the synod. He died at Geneva in 1649. D. was a somewhat intolerant Calvinist; but as a preacher, he was eloquent, persuasive, and conscientious. His Italian translation of the Bible appeared in 1607; his French, in 1644. Among his other works may be mentioned his *Annotationes in Biblia* (1607); *De Fictitio Pontificiorum Purgatorio* (1619); and *De Justa Secessione Reformatorum ad Ecclesia Romana* (1628).

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DI'ODON (Gr. two-toothed), a Linnæan genus of fishes, now giving its name to a family, *diodontidæ* (*gymnodontes* of Cuvier), of the order *plectognathi*. The fishes of this family have no distinct teeth, but their jaws, which are shaped like the beak of a parrot, are covered with a substance like ivory, formed of the teeth consolidated together. This is reproduced as fast as it is worn away by use, and the mouth is admirably adapted for grinding down the crustaceans and sea-weeds on which these fishes feed. Their flesh is mucous, and that of some is regarded as poisonous. None of them are used for human food. Some of them, particularly of the genera D. and *tetraodon*, have a remarkable power of inflating their bodies by filling their stomachs with air, the stomach being extremely dilatable, and assuming a globular form when distended, whence they have received the name GLOBE-FISH, whilst from the spines, which stand out in all directions, like those of a hedgehog when rolled up, as if for defense of the inflated body, some of them have been designated PORCUPINE FISH. When distended with air, they float in the water with the back downwards but are not incapable of swimming in this position, as was formerly supposed. The *diodontidæ* are fishes of warm seas; one or two species, occasionally wafted by the currents to more northern shores, are among the rarest of British fishes.—The SUNFISH belongs to this family. The name D. has recently—with the effect only of confusion—been given to a new genus of cetaceous animals, of which one very rare species has occurred on the British coast.

DIODO'RUS, SICULUS, a Greek historian, was b. at Agyrium, in Sicily. Little is known of his life beyond what is told by himself. He lived in the times of Julius and Augustus Cæsar, traveled in Asia and Europe, and lived a long time in Rome, collecting the materials of his great work, the compilation of which occupied thirty years. This work, the *Bibliotheca* or Library, was a history of the world, in forty books, from the creation to the Gallic wars of Julius Cæsar. It was divided by the author into three parts—the first of which, in six books, comprises all the Greek and foreign myths down to the Trojan war; the second, in eleven books, contains the history from the year 1184 B.C. to the death of Alexander the great; the third, in twenty-three books, continues the narrative of events from that date to the year 60 B.C. Of the *Bibliotheca*, the first five books are extant entire; the next five books are wholly lost; the next ten are complete; and of the remainder of the work, considerable fragments have been preserved. Had D. possessed any powers either of criticism or of arrangement, his work would have been of the greatest importance; but he was in both respects so deficient, that his history has no practical value beyond what belongs to an immense mass of raw, and now scarcely available material. His narrative is colorless and monotonous, and his diction, generally clear and simple, holds a sort of middle place between the pure Attic and the colloquial Greek of his time. The best editions of D. are Wesseling's (Amst. 1746), the Deux-ponts (1793–1801), and Dindorf's (Leip. 1828–31).

DIŒ'CIOUS (Gr. *dis*, twice; and *oikion*, a habitation), in botany, a term applied either to plants or flowers, when not only the flowers but the individual plants are unisexual—i.e., when male and female flowers are produced upon separate plants. D. plants form a distinct class in the Linnæan sexual system; but in thus placing them apart, if the principle of arrangement had been strictly maintained, great violence would often have been done to natural affinities; D. species frequently occurring in genera and families usually *monœcious* (q.v.) or *hermaphrodite*, and also monœcious and hermaphrodite species in those which are usually diœcious. Familiar examples of D. plants may be seen in most species of willow. Amongst cultivated plants, hemp, spinach, and the date-palm may be instanced.

DIOG'ENÉS, the cynic philosopher, was a native of Sinope, in Pontus, where he was born about 412 B.C. His father, Icesias, or Icetas, by name, and a banker by occupation, was convicted of having swindled, and so the young D. had to leave Sinope. His youth had been that of a spendthrift and a rake; but on coming from Sinope to Athens, he became interested in the character of Antisthenes, by whom, however, his first advances were repelled. In spite of his inhospitable reception, D. renewed the attempt to find favor with Antisthenes; but though often driven away by blows, his perseverance at last prevailed; and Antisthenes, moved with compassion, consented to admit him as a pupil. D., from being an extravagant debauchee, plunged into the opposite extreme of austerity and self-mortification. He would roll in hot sand during the heat of summer; in winter, he would embrace a statue covered with snow. His clothing was of the coarsest, his food of the plainest. His bed was the bare ground, whether in the open street or under the porticoes. His permanent residence (if such it could be called) was a tub, which belonged to the Metroum, or the temple of the Mother of the Gods. His eccentric life did not, however, cost him the respect of the Athenians, who admired his contempt for comfort, and allowed him a wide latitude of comment and rebuke. Practical good was the chief aim of his philosophy; for literature and the fine arts he did not conceal his disdain. He laughed at men of letters for reading the sufferings of Ulysses, while neglecting their own; at musicians who spent in stringing their lyres the time which would have been much better employed in making their own discordant natures harmonious; at savans for gazing at the heavenly bodies, while sublimely incognizant of earthly ones; at orators who studied how to enforce truth, but

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not how to practice it. He was seized by pirates on a voyage to Ægina, and carried to Crete, where he was sold as a slave. When asked what business he was proficient in, he answered: "To command men." His purchaser was Xeniades of Corinth; but the slave soon came to rule the master, acquired his freedom, was appointed tutor to the children, and spent his old age as one of the household. It was here that he had his interview with Alexander the Great. The king opened the conversation with: "I am Alexander the great," to which the philosopher answered: "And I am Diogenes the cynic." Alexander then asked him in what way he could serve him, to which D. rejoined: "You can stand out of the sunshine." Alexander is said to have been so struck with the cynic's self-possession, that he went away, remarking: "If I were not Alexander, I should be Diogenes." In spite of his early excesses and his subsequent privations, D. lived at Corinth till 323 B.C., when he died, at the age of 90.

DIOG'ENES OF APOLLONIA, flourished in Athens about 460 B.C. He was a pupil of Anaximenes, and a contemporary of Anaxagoras. He believed air to be the source of all being, and all other substances to be derived from it by condensation and rarefaction.

DIOG'ENÉS LÄER'TIUS, the author of a biographical history of the Greek philosophers, seems to have been born at Laerta, in Cilicia, and to have taken his surname from that town. So little is known of his personal history, that the very age in which he flourished is a matter of doubt. By some it is assigned to the end of the 2d, and by others to the middle of the 3d c. after Christ. His name has been kept alive by his *Lives of the Philosophers*, a work which contains a great mass of interesting information regarding the private lives and habits of the most eminent philosophers of antiquity. Though the work is utterly worthless in respect of plan, coherence, or criticism, it yet contains so many piquant anecdotes, and so many valuable quotations from lost works, that Montaigne's wish was perhaps a justifiable one—that instead of one Laertius, we had had a dozen. The best edition of Laertius is that of Hübner, 2 vols. 8vo (Leip. 1828–31).

DIOME'DEA. See ALBATROSS.

DI'OMEDE ISLANDS, a group about the middle of Behring's strait, form, as it were, a number of stepping-stones between the most easterly point of Asia and the most westerly of America. Their names are Fairway, Crusenstern, and Ratamanow; and their central point is in lat. 65° 46′ n., and long. 168° 55′ west.

DIOME'DES, the bravest, after Achilles, of all the Greeks who took part in the Trojan war. His exploits occupy a prominent place in the record of the heroic deeds sung by Homer in the *Iliad*. He vanquished in fight Hector and Æneas, the most valiant of the Trojans; and even Mars and Venus, when they took the field on the Trojan side, were attacked and wounded by him. In the games instituted by Achilles in honor of Patroclus, he gained the prize in the chariot-race, and worsted the mighty Ajax in single combat. Along with Ulysses, he carried off the Palladium, on which the fate of Troy depended. On returning to Argos (to the crown of which he had succeeded after the death of Adrastus), he found that his wife had proved unfaithful in his absence. Leaving home, he went, according to one tradition, to Italy, where he took part with the Trojans against Turnus. Several cities on the southern shores of that country claimed to have been founded by him.

DIOME'DES, son of Mars and Cyrene, king of the Bistones in Thrace. It was this Diomedes, and not the Trojan hero, who fed his mares upon human flesh. After he was slain by Hercules, the mares had the pleasure of eating their master.

DION OF SYRACUSE, 408–353 B.C.; brother-in-law of Dionysius the Elder; an admirer and pupil of Plato. Because of his stern moral character Dion became odious to the king, who banished him, confiscated his property, and gave his wife to another man. Dion made war upon Sicily and defeated the tyrant, but was soon supplanted by the intrigues of Heraclides and again banished. He was recalled soon afterwards, but the people complained of his tyrannical conduct, and he was assassinated.

DION CASSIUS COCCEIA'NUS, a celebrated Greek historian, was b. at Nicæa, in Bithynia, 155 A.D. He held various high offices of state under the Roman emperors, was twice consul, and enjoyed the intimate friendship of Septimius Severus. He is best known by his *History of Rome*, in 80 books, of which only 18 (from the 36th to the 54th) have reached us complete. The others are only known to us from fragments and abridgments. His high position gave him free access to the national archives, and as an authority on some points, especially on the imperial epoch of Roman history, his work is not without very considerable value. He wrote on the model of Thucydides, to whom, indeed, he is far inferior, both in vigor of judgment and acuteness of criticism; yet many passages of his History might be quoted as among the best samples of the rhetoric of the age in which he lived. D. died at Nicæa, but the date of his death is not known. The best edition of his History is that of Sturz (Leip. 1824–43).

DION CHRYSOSTOMUS (Golden-mouthed), an eminent Greek rhetorician, was b. at Prusa, in Bithynia, towards the middle of the 1st century. His father, Pasicrates, paid great attention to his education, which was also enriched by travel. D., after residing for some time in his native town, came to Rome, where, however, he had the mis-

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fortune to excite the suspicion of the emperor Domitian, and was in consequence obliged to flee. On the accession of Nerva, 96 A.D., he returned to Rome, and was honorably received. Nerva's successor, Trajan, held D. in the highest estimation, even permitting him to ride beside himself in the imperial chariot. His excellent disposition procured him many friends, while his remarkable powers of oratory excited universal admiration. He died at Rome about 117 A.D. D. left a very great number of orations, of which 80 are still extant in whole, with fragments of 15 others. They discuss questions in politics, morals and philosophy, and are written in pure Attic Greek. According to Niebuhr, he was "the first writer after Tiberius that greatly contributed towards the revival of Greek literature." Good editions of D.'s orations are those of Reiske (Leip. 1784), Emperius (1844), and L. Dindorf (1857).

DIONÆA, a very curious and interesting genus of plants of the natural order *droseraceæ*, having a 5-partite calyx, 5 petals, 10 to 20 stamens, and one style, with 5 closely united stigmata. Only one species is known, *D. muscipula*, sometimes called VENUS'S FLY-TRAP and the CAROLINA CATCHFLY PLANT. It grows in marshy places in the warmer parts of North America, as far n. as North Carolina, and is a perennial plant, with a rosette of root-leaves, from the midst of which arises a leafless stem (scape) about 6 in. high, terminating in a corymb of white flowers. It is remarkable for the irritability of its leaves. The leaf-stalk is elongated, winged, and leaf-like, and bears at its extremity an orbicular leaf, set round at the margin with stiff hair-like "spines," and having on its upper surface many small glands, and three delicate irritable hairs on each side, so placed that an insect can hardly traverse the leaf without touching one of them, when the two sides of the leaf immediately fold together upon it, and lay hold of it, the marginal bristles crossing one another, and preventing the possibility of escape. The leaf does not open again till the whole substance of the insect has been absorbed by the plant, and nothing but the skeleton of the captive remains. For this purpose, the plant exudes a secretion of a character somewhat similar in its digestive properties to pepsine; and under the influence of this, the material of the insect capable of yielding nourishment to the plant, is digested, and ultimately absorbed by the same glands that secreted the fluid. This process of digestion and absorption sometimes occupies three weeks.—See *Insectivorous Plants*, by Darwin. See illus., FLOWERS, vol. VI.

DIONYSIA, feasts of Bacchus, celebrated especially in Attica. The lesser Dionysia were held in country places in Dec., when the vine was grown. There was a vintage festival, songs, dances, impromptu plays, a phallic procession, and rustic sports. The greater Dionysia were held in Athens in Mar., as a festival of joy for the departure of winter and the promise of summer. The ancient image of the god was conveyed from one sanctuary to another, with a chorus of boys and a procession wearing masks and singing odes. The festival culminated in tragedies, comedies, and satiric dramas, in the great theater of Dionysus.

DIONYSIUS, THE AREOPAGITE, is mentioned in the Acts of the Apostles (chap. xvii., verse 34) as one of the few persons in Athens converted to Christianity by Paul. A history has been invented for him by the church. It is said that he was in Egypt when the crucifixion happened, and observing the eclipse that accompanied it, exclaimed: "Either God himself is suffering, or he sympathizes with some one who is suffering." At the time when Paul visited the metropolis of Greece, D. was a member of the council of the Areopagus, whence his name. Tradition also declares that the apostle installed him as the first bishop of Athens, and that he suffered the fate of a martyr. The writings which are falsely current under his name treat of such topics as the heavenly hierarchy, the names of God, the ecclesiastical hierarchy, etc. Their theology is of the mystical kind. The style, contents, and historic allusions clearly indicate that the author of these writings could not have flourished before the close of the 5th c., and, in fact, the writings first made their appearance in the 6th century. Dazzling neoplatonic phantasies concerning the divine essence, angels, and holy spirits, splendid descriptions of the ceremonies of the Catholic worship, glorifications of the priestly hierarchy, panegyrics on monastic life, and mystical interpretations of church doctrine, made the works immensely attractive, especially to the Greek monks, whose manner of life was preeminently contemplative. According to a recent hypothesis, the so-called writings of D. are the composition of some Christian Platonist, who, in opposition to the not yet wholly extinguished Gnosticism, sought to incorporate with Christianity the forms, ideas, and ceremonies of the Dionysian (Bacchic) mysteries. The translation of the work into Latin by Scotus Erigena, in the dawn of the middle ages, gave a new impulse to monasticism in the western church, and may be almost said to have created its mystic theology. The *Areopagitic theology* was, in fact, the name given during the middle ages, and even as late as the 18th c., to that mystical method of apprehending religious truth made current by the writings ascribed to D., and afterwards formally introduced into Latin Christianity by Hugo St. Victor in the 12th century. This theology proceeds upon the principle, that the divine spirit is indispensable even to the understanding of man.

DIONYSIUS, THE ELDER, tyrant of Syracuse, was b. 431 or 430 B.C. He was originally a clerk in a public office, but manifested at an early period a passion for political and military distinction. When the Agrigentines, after the conquest of their city by

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the Carthaginians, accused the Syracusan generals who had failed to relieve them of treachery, D. supported their accusations before the people of Syracuse, and induced the latter to appoint new commanders, of whom he himself was one. But in a very short time he supplanted his colleagues also, and, when only 25 years of age, made himself, by the help of his mercenaries, absolute ruler of the city. To strengthen his "tyranny" (the name given by the Greeks to any *usurped* authority, however wisely and beneficently exercised), he married the daughter of Hermocrates, the late head of the aristocratic party, and thus attached the followers of that leader to himself. After he had fiercely suppressed several insurrections, and conquered some of the Greek towns of Sicily, he made preparations for a great war with the Carthaginians. It broke out 397 B.C. At first, fortune favored D., but after a short time he suffered a series of reverses, so calamitous, all his allies abandoned him, and he was shut up in the city of Syracuse, apparently without hope of escape. When he was about to fall a victim to despair, a pestilence broke out in the Carthaginian fleet. D. took courage, and suddenly attacking his enemies by land and sea, obtained a complete victory. In the years 393 and 392 B.C., the Carthaginians renewed hostilities, but were defeated on both occasions, and D. was enabled to conclude a most advantageous peace. He now turned his arms against lower Italy, and in 387 B.C., after a siege of 11 months, captured Rhegium. From this time he continued to exercise the greatest influence over the Greek cities of lower Italy, while his fleets swept the Tyrrhenian and Adriatic seas. But D. was not contented with the reputation of being the first warrior and statesman of his age; he wished to shine as a poet also. He even ventured so far as to contend for the prize at the Olympic games, and about the end of 388 B.C., sent thither a splendid embassy, comprising the best reciters of the time, whose utmost skill, however, could not induce the judges to decide in his favor. D. was more successful at Athens, where he several times obtained the second and third prizes for tragedy, his last production even obtaining the first. He also invited many poets and philosophers to his court, his treatment of whom, however, was not always courteous. In 368 B.C., he renewed the war with the Carthaginians, whom he wished to drive out of Sicily altogether, but died in the following year, before he could accomplish his design. It was rumored that his death was hastened by his physician, at the instigation of his son. D. was unquestionably a most vigorous ruler, but unscrupulous as to the means he employed to secure his ends, and tormented in his last years by the suspicion that he was surrounded with traitors.

DIONYSIUS, THE YOUNGER, son of the preceding, celebrated his entrance into public life, 367 B.C., by a splendid festival, which lasted ninety days. His political education had been designedly neglected by his father, and in consequence he grew up an indolent, pleasure-loving, and dissolute prince. Dion, a relative of his father, sought to improve him by the instructions of Plato, but his endeavors were frustrated by Philistus, the historian, who disgracefully encouraged the excesses of the youth. Dion was banished, but afterwards returning to Sicily, expelled D. from Syracuse. The latter fled to Locri, the birthplace of his mother, Doris, where he was hospitably received. He repaid the kindness of the Locrians by making himself master of their city, which he ruled despotically for several years. In 346 B.C., the course of events enabled him to return to Syracuse, but he could not firmly re-establish himself. His cruelties drove the citizens to ask the aid of the Corinthians against him. Timoleon was sent to their assistance, and D., shut up in the citadel of Syracuse, was compelled to surrender, 343 B.C. He was brought to Corinth, where he soon squandered the wealth which he had carried away from Sicily, sunk into obscurity, and died in extreme poverty.

DIONYSIUS OF ALEXANDRIA SAINT, d. 265 A.D., at Alexandria, where he was born. He was of a noble pagan family, but was an early convert to Christianity, and under the tutelage of Origen became a priest, and chief of the Alexandrian school of theology. In 247, he became a bishop. In the persecution of Decius, about this time, he was arrested and condemned to death, but was rescued by peasants, and remained concealed for a year in the Libyan desert. In 257, he was again exiled, but restored three years later. He was a voluminous writer, but most of his works are lost.

DIONYSIUS, OF HALICARNASSUS, a learned critic, historian, and rhetorician, was the son of one Alexander of Halicarnassus, and was b. probably about the middle of the century before Christ. He came to Rome at the termination of the civil wars, 29 B.C., and resided there for 22 years, familiarizing himself with the language, literature, and antiquities of the Romans. His death occurred shortly after 7 B.C. D.'s most valuable work is unquestionably his *History of Rome*, although it does not exhibit the finest qualities of his mind. The author was an admirable rhetorician, but had very little political discrimination, and no perception of the difference between a myth and a historic fact. Yet, inasmuch as it contains a mine of information about the constitution, religion, history, laws, and private life of the Romans, it will always command the regard of scholars. Of the 20 books of which it originally consisted, we possess only the first 9 in a complete form, the 10th and 11th nearly so; and of the rest, only a few fragments. The first edition of the Greek original was that by Stephens (Paris, 1546), but a very good Latin version was published as early as 1480. Angelo Mai

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published (Milan, 1816) a collection of the fragments of the lost books from a MS. in the library at Milan, the genuineness of which has been doubted by Niebuhr. The rhetorical and critical works of D. are of the highest literary merit. The principal are his *Censura Veterum Scriptorum*, his *Ars Rhetorica*, and his *De Compositione Verborum*. The first complete edition of the history (or Archæologia, as D. called it) and rhetorical works was that of Fr. Sylburg (Frankfort, 1586); one of the best is that of Jakoby (2 vols., 1885–88).

DIONYS'IUS, or DENIS, 1261–1325; King of Portugal, son of Alfonso III., whom he succeeded, 1279. He married Elizabeth of Aragon. His reign was wise and just, and the beneficial reforms he instituted gained him the title of "father of his country." He built cities and fortifications, and founded the university of Lisbon.

DIONYSIUS, surnamed THRAX ("the Thracian") a native of Alexandria, who taught at Rhodes and at Rome about 100 B.C. His *Technē Grammatikē* is the foundation of all subsequent European works on grammar. The best edition is that of Uhlig (Leip., 1884).

DIONYS'IUS EXIG'UUS, a Roman monk of the 6th c., a native of Scythia. He was the compiler of the first regular ecclesiastical code for the western church. He is more widely known in chronology as the founder of the "Dionysian Æra" which was observed by Christians for more than a thousand years. Before this the Christian era had started from the death of Christ; he fixed it as nearly as possible at the time of the birth.

DIONYSUS. See BACCHUS.

DIOPHANTINE ANAL'YSIS is that section of the theory of unlimited or indeterminate problems which attempts to find rational and commensurable values answering to certain equations between squares and cubes. This class of problems was first and and chiefly treated of by Diophantus (q.v.), who has given his name to the theory of their solution. We shall not here attempt to explain the nature of the analysis, which is very subtle, and guided by few general rules. The difficulties of the solution of diophantine problems in most cases fail to be overcome by the skill and ingenuity of the analyst. We confine ourselves to stating the following examples of the problems solved by the D. A.: 1. To find 2 whole numbers the sum of whose squares is a square. 2. To find 3 square numbers in arithmetical progression. 3. To find a number from which 2 given squares being severally subtracted, each of the remainders may be a square.

DIOPHAN'TUS, a distinguished Greek mathematician, lived at Alexandria, according to some, about the middle of the 4th c.; according to others, about the close of the 5th. His name first occurs in the life of Johannes Damascenus, written by John, patriarch of Jerusalem, in the 8th century. He is commonly represented as the inventor of algebra, but he himself speaks of that science as known before his time. It is possible he may have been acquainted with Hindu algebra; at all events, according to De Morgan, there is a very great similarity between the Hindu algebra and that of Diophantus. He occupied himself chiefly with the class of problems characterized in the preceding article. Of his valuable work, the MS. of which was discovered in the 10th c., *Arithmetica*, consisting originally of 13 books, only 6 have been preserved. Besides this we possess a book on polygonal numbers. The best edition is that of Fermat (Toulouse, 1670); there is a German translation by Schulz (Berl. 1821).

DIOP'SIS, a genus of dipterous insects of the same great family with the house-fly, remarkable for the prodigious prolongation of the sides of the head, so as to form stalks for the eyes, which are thus removed to a distance from the body of the insect, almost equaling in some species the length of its wings. All the species are found in warm parts of the old world.

DIOP'TRICS is that branch of geometrical optics (see OPTICS) which treats of the transmission of rays of light from one medium into another, differing in kind. It consists of the results of the application of geometry to ascertain in particular cases the action of what are called the laws of refraction. When a ray of homogeneous light is incident upon a surface, the angle which its direction makes with the normal or perpendicular to the surface at the point of incidence is in D., as in catoptrics, called the angle of incidence. The angle which the refracted ray makes with the same line is called the angle of refraction. This being premised, we may state the laws of refraction. 1. The incident and refracted ray lie in the same plane with the normal, at the point of incidence, and on opposite sides of it. 2. The sine of the angle of incidence, whatever that angle may be, bears to the sine of the angle of refraction a constant ratio dependent only on the nature of the media between which the refraction takes place, and on the nature of the light. According to the second law, if we call the angle of incidence i, and that of refraction r, we shall have $\sin i = \mu \sin r$, where μ is a quantity depending upon the nature of the media and of the light. It will have, for instance, a certain value for refraction from vacuum into glass, another from glass into water, and so on; also, it will have one value for red light, another for green, and so on. The quantity μ is called the refractive index, and is greater than 1 when refraction takes place from vacuum into a medium, and in general is greater than 1 when the refraction

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is from a rarer into a denser medium, and less than 1 when the opposite is the case. In D., the laws of refraction may be considered as depending for their truth upon experiment; in physical optics, they are deductions from an hypothesis respecting the constitution of light. They are not merely approximately true; they are absolute physical laws.

Before proceeding to consider the simpler leading cases of refraction, one or two interesting propositions in dioptrics require to be explained.—1. If the refractive index for a medium, when light is incident upon it from vacuum, be μ, and the index for another medium, under the same circumstances, be μ', then, when light proceeds from the second medium into the first, the refractive index is $\frac{\mu}{\mu'}$. The proof of this proposition depends upon the two following experimental laws: (1.) If a ray of light proceed from a point to a second, suffering any reflections or refractions in its course, then, if it be incident in the reverse direction, i.e., from the second point, it will follow the exactly reverse course to the first point. This is proved by experiment, but may be accepted as axiomatic. (2.) If a ray pass from vacuum through any number of media, having their faces plane and parallel, when the ray emerges into vacuum its direction will be parallel to that which it had before incidence. To deduce the proposition from these laws, let i be the angle of incidence from vacuum upon the first medium, r the angle of refraction, which will also be the angle of incidence upon the second medium. Also let r' be the angle of refraction into the second medium, which will also be the angle of incidence upon the second bounding surface. By the second of the preceding experimental laws, the angle of emergence into vacuum will be i. Hence we shall have by the first of these laws, $\sin i = \mu' \sin r$ at the first surface, and $\sin i = \mu \sin r'$ at the second. From these equations, we have $\sin r = \frac{\mu}{\mu'} \sin r'$, which proves the proposition. It follows that if μ be the refractive index from vacuum into a medium, that from the medium into vacuum will be $\frac{1}{\mu}$.—2. Our second proposition relates to what is called the *critical angle*. If i be the angle of incidence of a ray within a medium, the refractive index of which is μ, and r the angle of refraction into vacuum, then we have from the former proposition $\sin i = \frac{1}{\mu} \sin r$. From this formula, if i be given, r may be found, and a real value will be given to r so long as $\sin i$ is $< \frac{1}{\mu}$; but when i has a value greater than that determined by the equation $\sin i = \frac{1}{\mu}$, the formula fails to give us a value of r, for the sine of an angle cannot be greater than 1. And experiment shows that, in fact, there is no refracted ray when the angle of incidence is greater than that above assigned, the ray being wholly reflected within the medium. The angle of which the sine is $\frac{1}{\mu}$ is called the *critical angle*. For glass, it is about 41° 45′; for water, about 48° 30′. This angle is sometimes called the angle of *total reflection*. In internal reflection at the surfaces of media, the reflected light is more nearly equal in intensity to the incident than in any other case of reflection. While it thus appears that refraction from a denser into a rarer medium is not always possible, it may be added, that it is always possible from a rarer into a denser.

We shall now investigate some simple cases of refraction. 1. And first of refraction at a plane surface. Let DIMN (fig. 1) be any medium bounded by a plane DI, and let R be a radiant point, and RD and RI two incident rays of a divergent pencil proceeding from R to the surface of the medium; then RD being perpendicular to the surface, suffers no refraction, but proceeds along DM within the medium; but RI is refracted in the direction IN, which, produced outwards, meets the normal DF in F. Therefore, a small pencil of rays proceeding from R, and having RD, perpendicular to the surface, for axis, will be refracted into another pencil diverging from the imaginary focus F; for all the rays intermediate between RD and RI will converge very near F when the pencil is small. An eye within the medium, and between N and M, would thus, the pencil being small, see the luminous point R, as if it were at F, or further off than it really is. In the opposite case, in which the luminous point is within the refracting medium, similar reasoning shows that after the rays emerge from the plane surface into the air, they will, if the pencil be small, appear to proceed from an imaginary focus nearer to the surface than the luminous point.

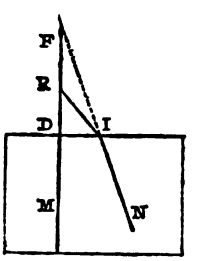


Fig. 1.

2. The case of refraction through a prism, which we are next to consider, is, in fact, the case of refraction through a medium bounded by plane surfaces which are not parallel. Conceive two planes at right angles to the plane of the paper, and making on

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that plane the figure BAC (fig. 2). The question is as to the laws of transmission of a ray, SPQR, of homogeneous light through the prism. Draw mn' and $n'n$ perpendicular to the sides. Then $n'PQ$ and $n'QP$ are respectively the angels of refraction at the first, and of incidence at the second surface. Now, as $n'QA$ and $n'PA$ are each of them right angles, and as all the angles in the figure $n'QAP$ are equal to four right angles, it follows that the angles at n' and at A together are equal to two right angles. But the angle at n', together with the angles $n'PQ$ and $n'QP$, are equal to two right angles; therefore must the angles $n'PQ$ and $n'QP$ together be equal to the angle at A. In other words, in refraction through a prism: *The sum of the angles of refraction at the first surface, and of incidence at the second, is equal to the angle contained between the plane sides of the prism.* From this it might be shown, that the deviation of a ray caused by passing through a prism is always towards the thicker part of the prism, if the medium be denser than the surrounding atmosphere. It is a geometrical proposition which the student may solve for himself, that if i be the angle of incidence at the first surface, and e that of emergence at the second, and if α be the angle of the prism, then σ, or the change of direction of the ray in its passage, is obtained from the formula $\sigma = i + e - \alpha$.

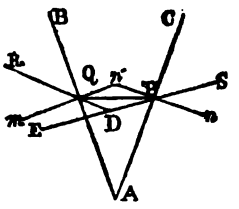


Fig. 2.

3. We now take up the case of refraction at a single spherical surface of a medium denser than the surrounding air. And first, of parallel rays refracted at a convex spherical surface. Let ABQP (fig. 3) be the refracting medium, whose terminating convex surface is spherical, C being the center of the surface, and V its vertex. Let XV be the axis of a pencil of parallel rays, of which any ray, RI, is incident at I. Then, if CIN be a normal, the angle of refraction, CIF, will be less than the angle of incidence, RIN, and the refracted ray will thus turn towards the axis, and meet it at some point, F. When the pencil is small, or the aperture, AVB, of only a few degrees, the rays will clearly nearly all converge to the same point, F. To find the position of F, we have, in the triangle ICF, the angle $CIF = r$, the angle of refraction, and ICF, the supplement of ICV or NIR (by parallel lines), i.e., of i, or the angle of incidence. Therefore, IF is to CF : : sin i is to sin r. And as for a very small pencil, IF may be taken = VF, we have FV : FC : : sin i : sin r, or : : μ : 1. And putting FV = F, the principal focal distance, and VC = R, we have $F = \frac{\mu}{\mu - 1} R$. If the medium be crown-glass, for which the value of μ is $\frac{3}{2}$, we have $F = \frac{\frac{3}{2}}{\frac{3}{2} - 1} R$, or F = 3 R; i.e., the principal focal distance is equal to three times the radius of the sphere. The student may, by similar reasoning, ascertain for himself the focus of parallel rays incident on a concave spherical refracting surface, as also the focus in the case of a pencil of parallel rays within the medium and emerging from it. The case of a divergent pencil is incapable of such elementary treatment as to justify its insertion here. For branches of the subject treated under separate heads, the reader should refer to the articles Caustic, Lens, and Refraction. Under Refraction, he will find a table of the values of μ—the refractive index for various media and kinds of light. See also the articles Spectrum and Chromatics.

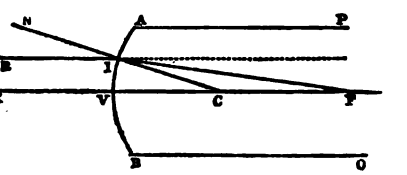


Fig. 3.

DIORA'MA. See Panorama.

DIORITE, a kind of rock, *greenstone* (q.v.) in part, is a crystalline mixture of oligoclase or some allied feldspar and hornblende with magnetic iron and apatite. Where free quartz occurs, the rock is called quartz-diorite. The more compact dark varieties have been termed *aphanite*. The chemical composition of diorite is as follows: Silica, 53.2; alumina, 16.0; potash, 1.35; soda, 2.2; lime, 6.3; magnesia, 6.0; oxides of iron and manganese, 14.0. The mean specific gravity is about 2.95. Diorite occurs as an eruptive rock under conditions similar to those of quartz-porphyry and syenite. It is found also in paleozoic volcanic regions, as in North Wales, in peculiar masses which may mark the position of some of the volcanic orifices of eruption. See Trap-Rocks.

DIOSCORE'ÆCEÆ, a natural order of plants, of which the genus *dioscorea* (see Yam) is the type. They are twining shrubs, with large tubers, either above or below ground. They are generally classed with endogenous plants; they are among the *dictyogens* of Lindley. There are about 120 known species. The most important plants of the order are the different species of *dioscorea* or yam (q.v.). Black bryony (q.v.) is its only representative in the British flora. *Testudinaria elephantipes*, a s. African species, sometimes called *elephants' foot*, and *Hottentots' bread*, has a large fleshy rhizome, with a rough cracked bark, which is used as food by the Hottentots in times of scarcity.

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DIOSCO'RIDES, PEDANIUS, or PEDACIUS, a Greek physician, was a native of Anazarba, or Anazarbus, in Cilicia, and flourished in the 1st or 2d c. of our era. He accompanied the Roman armies as physician through many countries, and collected a great store of information and personal observation on plants. In his great work, *De Materia Medica*, he treats of all the then known medicinal substances and their properties, real or reputed, on the principles of the so-called "humoral pathology." Two other works bear the name of D., but their genuineness is very questionable. During 15 centuries, D. maintained undisputed authority in botany and in materia medica, an authority which he still holds among the Turks and Moors. The best editions of D. are by Saracenus (Frankf. 1598) and Sprengel (2 vols., Leip. 1829). The *De Materia Medica* has been translated into the Italian, German, French, and Spanish languages. There is also an Arabic translation in MS. in various libraries of Europe.

DIOSCOR'IDES PEDA'NIUS, a Greek botanist of about the 2d or 3d c. after Christ. He traveled far and wide studying plants, and wrote a famous work on their nature and medicinal qualities. The work is still held in high esteem.

DIOSCU'RI. See CASTOR AND POLLUX.

DIOSMA. See BUCKU.

DIOSPYROS. See DATE PLUM and EBONY.

DIP, in geology, is the inclination of strata downwards into the earth. The amount or angle of dip is the degree of deviation from a level line, or the plane of the horizon. The point of dip is the point of the compass to which the dip is inclined.

DIP OF THE HORIZON, the angle comprehended between two lines drawn from the point of observation, one horizontal, the other a tangent to the surface of the sea; the apparent angular depression of the visible horizon.

DIPHTHE'RIA, or DIPHTHERI'TIS (Fr. *diphtherite*, from Gr. *diphthera*, a pellicle), a name first applied by M. Bretonneau of Tours, a distinguished French physician, to a form of very fatal sore throat occurring epidemically, chiefly in children, and apt to be confounded both with croup (q.v.) and with malignant sore throat *angina maligna*), as it is found in connection with scarlatina (q.v.). Diphtheria is distinct from both these diseases, not only in its symptoms, but in the character and position of the morbid changes on the mucous membrane. In croup, there is a pellicular membrane, indeed, but it is almost confined to the air-passages, and centers in the larynx (q.v.); in diphtheria, it usually begins in the pharynx or back of the throat, and often extends down the esophagus, or gullet. Croup is also a much more decidedly inflammatory disease than diphtheria. Malignant or ulcerative sore throat has even less in common with diphtheria; for in the latter there is no ulceration in the majority of cases, the mucous membrane being merely covered over with a more or less thick veil of false membrane; in both affections, however, there is enlargement of the glands behind the ear and in the neck, generally in the neighborhood of the parts internally affected. The throat affection in diphtheria is often accompanied by a very low and dangerous form of fever, with great and rapid loss of the patient's strength, which is still further reduced of course by the inability to take food; in other cases, the disease is fatal by suffocation, and tracheotomy has been performed (in some few instances successfully) to relieve the patient from impending death. After the acute disease is over, the recovery may be delayed by paralytic symptoms of various kinds; or simply by extreme debility, with exhaustion and loss of appetite. Diphtheria is in reality a very old disease with a modern name, unfortunate because misleading, and the cause of much inefficient treatment. By many the disease has been regarded as a local more than a general affection, but within the last twenty years thorough study has revealed its nature and causes so that few things are more certain than that it has for many centuries been one of the dangerous diseases of the human race. That its characteristics were always precisely what they now are is not probable, because the sanitary condition of the world centuries ago, when devastating *plagues* swept the face of the earth, would be likely, especially when large numbers of human beings were collected together, to give this disease a more general inflammatory and malignant character. The causes which are now known to produce the disease have always been present wherever the human family has congregated in numbers, and wherever even a few have lived together without regard to cleanliness. It is thought that descriptions of the disease can be traced to a time anterior to Hippocrates (460 B.C.), and there is no doubt of its identity with that described by Aretæus of Cappadocia (100 A.D.), who called it Ulcus Syriacum and also Malum Egypticum. Several other ancient authorities describe it, but during the dark ages little is recorded that is trustworthy. One of the earliest treatises upon it in modern times was by Hecker, who gives an account of an epidemic which prevailed in Holland in 1337. Besides the names given it by Aretæus, it has been called *cynanche maligna, cynanche gangrenosa* (cynanche means, literally, "dog-choke"), putrid fever, malignant inflammation of the pharynx, and putrid sore throat. The last name was the one adopted by the celebrated Dr. John Fothergill in his description of the epidemic which appeared in London in 1745. Some have contended that the disease which he described was malignant scarlet fever, but so accurate an observer and great physician as Dr. Fothergill, drawing the distinctions, as he does, between the diseases, could not

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have been mistaken. His treatise, published in his works, is in many respects unexcelled. Of course some of the remedies now found most efficient were either not then known, or not obtainable in their best form, but his general treatment was more rational than much of more modern date; indeed it was not greatly different from that which an experienced physician of the present day would employ if limited to the remedies which were then available. The disease is well described by Dr. Samuel Bard of New York, in the first volume of the Transactions of the American philosophical society, in the review of an epidemic which appeared in 1771. The disease did not again attract the special attention of *writers* until 1818, when Bretonneau published his opinions and gave it the name under which it is now generally known, claiming, in his first papers upon the subject that the disease was at first local, and that the constitutional affection resulted from infection propagated by the local disease. The origin of diphtheria was ascribed by Vogel to the development of a microscopic organism, the *oidium albicans*, but this is also largely developed in Thrush, and is present in various diseased conditions of the mouth and throat. The present doctrine is, simply, that the disease is caused by certain disease germs, but what they precisely are has not been determined. This much is certain—D. is a septic disease, never found where no septic origin can be assigned. Feculent matter, passing through stages of putrefication and fermentation, such as obtains in sewers, cess-pools, and vaults of privies, and all manner of conduits or receptacles of waste matter, and the effluvia engendered in piles and masses of garbage, or of human or animal excrement, are the now recognized causes of diphthereia. Wherever these causes are constant, there the disease is constantly developed and is *endemic*. The only apparent exception to this is that at certain seasons of the year putrescent and feculent matter is liable to develop other diseases, when D. may occupy a more or less subordinate place. Again, there may be times when the septic causes are in abeyance; but when they become active, the disease becomes *epidemic* if the air is sufficiently impregnated with the infectious germs. In regard to the question of contagiousness or infectiousness, the following may be said, premising, however, a few words explanatory of these terms. In many respects contagiousness and infectiousness are synonymous, and some writers use only the former word. But there is this difference—such diseases as scarlet fever and small pox are contagious, and they are communicated through the air as well as by contact. There are other diseases which are contagious only by contact, as the itch. It would be more correct to call itch an infectious disease. Most other diseases which are communicated in the same manner are infectious. It appears, therefore, that there is some confusion in the use of the terms, and it is for this reason that some authorities use only the word contagious. But there are two distinct modes, and some diseases are communicated only by one of these modes; and if we desire to express the difference, the employment of the two terms is convenient, but care should be taken to distinguish clearly what idea it is intended to convey. If D. be a communicable disease, but not in the same manner as scarlet fever, we distinguish the difference by calling the former an infectious disease; and that D. has been communicated by contact there is no reasonable doubt. There have been many instances when diphtheritic expectorations have communicated the disease by being projected into the mouth or eyes of the attendant. Bretonneau and others maintained this. It is a matter of dispute as to whether exposure to the air breathed by patients having the disease is capable of communicating it, but the great mass of authority is now on the side of the affirmative. What is the explanation of this disagreement? The poison of D. is a species of ferment, and like many other ferments, it requires a certain quantity to produce a given effect. The contagious virus of small-pox is different; the minutest quantity, when inhaled, or when introduced by vaccination, being sufficient to propagate itself throughout the system, and there seems to be no provision of nature for its elimination until a crisis is reached. The poisonous principles which propagate some other diseases, when taken into the system do not need to ripen before they are again cast out; the excretory action of the animal economy sometimes removes them as fast as they are received. It is because of this conservative power, this action of the *vis medicatrix naturæ*, that mankind, as well as the lower animals, have been enabled to exist. We are all the time taking poisons into our bodies, and it is one of the offices of the various organs to remove them by the various processes of excretion. The poisonous principle of ordinary intermittent fever, if received only in small quantities, is readily disposed of, and the system retained in a healthy condition, but if the malarial poison be absorbed faster than it can be carried away, there results a series of morbid phenomena characteristic of this pericdical disease. And so it is, most probably, with diphtheria; if the air of a sick-room be loaded with the effluvia from the breath and perspiration of a person laboring under a violent case of the disease, one who should remain in the room only a few moments, would be likely to receive enough germs of the disease to cause a manifestation of its presence, and if he were to remain a considerable time there would be danger of a serious attack. On the contrary, if the case were a mild one, or if the sick-room were well ventilated and disinfected, and the visitor were in good health, the danger would be slight. It is these varying circumstances which have caused a difference of opinion between different physicians; but the weight of evidence supports the opinion that D. is both contagious and infectious, and in a late work, Drs. Pepper and Meigs of Philadelphia give this as their conclusion.

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Although diphtheria (or putrid fever, a more appropriate name, and comprehensive of all the phases of the disease) is eminently a constitutional affection, it is liable to special local manifestations, the latter sometimes apparently predominating. Now, why does it so often have predominating local characteristics? The following is probably the explanation. The attack is usually brought on by a "cold," and if the system be only slightly contaminated at the time, the symptoms are not likely to be alarming, and will readily yield to prompt treatment, but it should always be borne in mind that the disease is exceedingly stealthy and treacherous, and to be watched like a wolf. Again, the system may be considerably loaded with the germs of the disease, although not to the culminating point. Here, also, causes which produce a "cold" will, besides bringing on the general attack, also give rise to violent local symptoms. But when no exciting causes occur to hasten the attack, and the septic poison is being constantly received, there comes at last a time when a fully developed case of putrid fever will make its appearance, a disease of the gravest character, but which may be recovered from.

One of the conclusions which have been arrived at by the medical profession is that those who live in badly ventilated or drained houses are, with perhaps some exceptions depending on the effects of temperature which are not yet well understood, constantly in a condition which renders them liable to a diphtheritic attack of varying importance. It is true that there are physicians who do not like to pronounce certain cases of sore throat as diphtheritic, unless they have more or less of an alarming character, or appear during an undoubted epidemic, but diphtheria is so treacherous a disease that it is not well to strive to balance arguments at the risk of life, especially when observation has almost surely decided the question on the safe side. It is well known that persons are not as likely to take a "cold" on our Pacific coast or in some of our western territories, as in the Mississippi valley, or between it and the Atlantic ocean. It is therefore probable that organic matter has much to do with the development of "colds;" undoubtedly it has with that of influenza. If we call this organic matter zymotic, then we may assume that with the aid of the vitality of the system it works itself out, or recovery takes place without recourse to medicine. Now, in regard to the septic germs of diphtheria, it is known that they are generally present in the effluvia of cess-pools, sewers, and filthy habitations, perhaps more especially developed or active in the temperate and moist weather of spring and autumn, and mild winters. Therefore, it is reasonable to believe that persons inhabiting badly drained localities, where putrescent effluvia more or less pollutes the air, never have inflammatory affections of the mucous membrane of the mouth or fauces, without having it more or less modified by this circumstance. All persons, therefore, who live in houses where the drain-pipes are not properly trapped, and where there is more or less intrusion of sewer gas through the wash-basins, bath-tubs, etc., will have reason to suspect that when they have febrile symptoms, alternating with chills, but unlike those of fever and ague, and a feeling of weariness, whether accompanied with pain in the throat, or not, there may be diphtheritic complications. The above symptoms are those of milder cases. The attack, when acute, frequently commences with a decided chill, followed by a high fever. The chill and the fever are characteristic, and generally easy to be recognized by the experienced physician. The pulse, however, affords a still stronger indication, and when taken in connection with the chill and the following fever, and the condition of the throat, together with the surrounding sanitary conditions, is quite diagnostic. It is variable, and soft and weak; sometimes quite full, but easily compressible; sometimes not more frequent than in health, but generally ranging from 100 to 140 beats per minute; sometimes reaching 160, and in children going still higher. The cheeks are often of a bright red color, one cheek often much redder than the other, the latter sometimes being quite pale. There is a fluctuation in the circulation, and also, apparently, a fluctuation in the nervous force of the system, It must not be supposed that the throat affection, even when serious, will be indicated by pain, for there is often found considerable mischief, upon inspection, where the patient suspected nothing of the kind. There may be pain only on swallowing; while on the other hand there may be diminution of sensitiveness, especially in grave cases, when also the muscles of deglutition may be so paralyzed as to interfere with swallowing, and in extreme cases there may be paralysis of different parts of the body, generally affecting one side more than the other; but this condition, caused by the great development and accumulation of poisonous matter, may be relieved by the prompt administration of proper remedies. The disease is, indeed, singular in some respects. Although sometimes perfectly unmanageable, and causing death in a few hours, it is at times, even when violent, easily overcome, if attacked with resolution and courage. The paralysis which sometimes occurs at the commencement of the disease must not be confounded with that which often comes on during convalescence after serious attacks. The breath is always more or less fetid, and in severe cases is very offensive. Sometimes the membranous exudation is extensive, spreading over a considerable portion of the fauces, often causing sloughing, especially when efficient remedies are not employed. The exudation may not be confined to the throat or any part of the air passages, but may form on the mucous membrane of the intestines, and has been recognized in the evacuations of the rectum. It may also form on the mucous membrane of the larynx or wind-pipe, or even pass into the bronchial tubes, and when diphtheritic sputa has been thrown upon the mucous membrane of the eyelids, exudations have developed there. Observation has shown that the range of temperature in the axilla is lower than

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in other acute diseases. There is usually loss of appetite, with vomiting, and often diarrhea; the latter are unfavorable symptoms. There is more or less delirium in all severe cases, and unless good treatment is speedily adopted the throat is liable to become gangrenous. There is great variableness, no doubt, in the virulence of the poison during different epidemics, and sometimes three fourths of the members of a family will die. The urine, in a majority of cases, at some time during the attack contains albumen, and the symptom is regarded as unfavorable, yet a majority of such cases recover. The neck is often considerably swollen, with considerable inability to move the jaws or to swallow. The tongue and throat are covered with a thickened mucus; the tonsils are generally considerably swollen when the first examination is made, and may have patches of a grayish or yellowish membrane upon them. The membrane, however, is sometimes not seen, either upon the tonsils or other parts of the mouth or throat, till the second day. The tonsils generally increase in size, and sometimes close the entrance to the wind-pipe, and render swallowing very difficult. The color of the parts is also peculiar; indeed, many of the symptoms of D. are peculiarly characteristic, usually making the diagnosis, especially when the history of the person is taken into consideration, easy.

It ought to be more generally known that D. is a disease in which relief must be expected from the use of medicines. It is septic, progressive, and cumulative; and when the system has been fully charged with its germs, it is likely to go to a fatal termination, the functions of the body seemingly participating in furnishing material for the spread of the disorder. The enemy must be repelled by such weapons as are deadly to disease germs. Disinfectants should be freely used, and medicines which keep up the animal strength. A generous diet of easily digested food, such as beef-tea, milk-punch, eggs and wine, boiled rice, and as a beverage, rice-water, with tender beefsteak as soon as the stomach will bear solid food, should be combined with such medicines as quinine and the tincture of chloride of iron. There is great waste of alkaline material in the blood in these cases, and this should be restored by the judicious administration of alkaline carbonates and chlorates. The amount of alcoholic stimulants required is variable; sometimes small quantities only are needed, but frequently they are required to combat the wonderfully depressing influence of the poison, their remedial action being similar to that which they have in cases of bites of poisonous reptiles. It is fortunate that in nearly every case the membranous exudation takes place above the larynx, or in that part of the throat which can be reached by a gargle or a sponge probang. This allows of the application of antiseptics, and no better one can be employed than a solution of carbolic acid, in the proportion of a dram, or a dram and a half, of the pure acid to a quart of water. This should be used as a gargle frequently, every half-hour, hour, or two hours. In young children who cannot gargle, a solution of rather greater strength may be applied with the sponge probang. This will in most cases relieve the local symptoms and cause the disappearance of the exudation in a few days, if the general treatment be judicious. A saturated solution of chlorate of potash may often be employed as a gargle in mild and chronic cases, but will not at all meet the demands of a severe case. What is known as chloride of soda, when properly diluted, forms a good topical application, and before the introduction of carbolic acid, was used with great success, and is still employed by many physicians. In 1894 a new treatment for diphtheria was successfully introduced by Dr. Koch (q.v.), of Berlin. It being established that death in diphtheritic cases is usually due to a chemical substance (a toxine) produced by the bacilli of the disease, it was further shown that small quantities of this substance can produce in subjects who are inoculated with it temporary immunity from the disease. In other words, a tolerance of it can be established, or, rather, an antagonistic substance (anti-toxine) is generated in the blood. The new treatment, therefore, consists in injecting hypodermatically into persons who have been exposed to contagion small quantities of the blood of animals that have been rendered immune, as described above. This treatment was adopted by the New York Board of Health in 1894 at the suggestion of Drs. Edson and Biggs, and the Board now furnishes the anti-toxine to all physicians free of charge.

DIPH'THONG (Gr. having a double sound) means two vowel sounds following one another so closely as to form but one syllable, as in *out*. In this combination the sound is really composed of an *a* as heard in *father*, and a *u* as heard in *put*. Many double vowels in English are not real diphthongs, there being only one sound heard. The spelling of the English language has little or no relation to the pronunciation in this matter. In many syllables written with two vowels, only one sound is heard, as in *bread*. The single vowel letters, again, often have a diphthongal sound; thus, the long sound, as it is called, of *i* is really composed of the sound of *a*, as heard in *father*, and that of *e*, in *me;* and *tune* is pronounced as if written *teun* or rather *tyun*. Such words as *bread, field*, which are now monophthongs, were doubtless at one time real diphthongs, and are still so pronounced in many parts of England.

DIPLACAN'THUS, a genus of fossil ganoid fishes, peculiar to the old red sandstone, in which six species have been found. The body was covered with very small scales, and the tail was heterocercal There were two dorsal fins, which with each of the other fins were furnished with a strong spine in front, the base of which was simply imbedded in the flesh, as in the dog-fish, and not articulated, as in the siluroids. The head was large, and the mouth wide, and open obliquely.

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DIPLOGRAP'SUS, a genus of fossil zoophytes, differing from the graptolite (q.v.) in having a double series of cells. They are found in great abundance in the anthracitic shales of the Silurian measures.

DIPLO'MA (Gr. *diploō*, I double, or fold). This term originated in the ancient custom of writing solemn documents on two tablets of wax, which were doubled, or laid one upon the other (see DIPTYCH), or on writing material which was folded. The Roman emperors were in the habit of giving diplomas to public servants, and to couriers, to enable them to procure the use of the public servants and horses; hence diploma came to signify a royal charter or prince's letters-patent. The term is now mostly applied to instruments given by universities and other learned societies, in proof of the holder having attained a certain degree; or to the licenses held by professional persons to practice their art.

DIPLOM'ACY, the art of managing the intercourse and adjusting the relations of foreign states, by means of ambassadors, envoys extraordinary, consuls, etc. The principles and rules of D. are embodied partly in those international customs and usages which constitute what may be called common, and in those treaties which may be regarded as statute international law. The diplomatic relations of Gt. Britain are practically under the superintendence of the secretary of state for foreign affairs, but the power of sending ambassadors to, and receiving ambassadors from, foreign states, is an alienable privilege of the crown. It was doubted whether an exception had not been made in the case of Rome, by the statutes passed against papal encroachments; and it was thought expedient to remove such doubt by 11 and 12 Vict. c. 108, which authorizes her majesty to enter into diplomatic relations, provided that no person in holy orders in the church of Rome, or Jesuit, or member of any other religious order, community, or society of that church, bound by monastic or religious vows, shall be received as ambassador at the court of London. Ambassadors are not subject to the municipal laws of the states in which they reside, the theory being that they represent the persons of their respective masters, who cannot be subject to any other laws than those of their own country. If an ambassador offends against the municipal law, or abuses his character, he may be sent home, and accused before his master. Though there was much doubt on the point, this rule seems to extend to crimes against natural law, e.g., to murder, or *mala in se*, as well as to crimes artificially created by the policy of the particular state, *mala prohibita;* and it is now said that the case of Don Pantaleon Sa, the brother and secretary of the Portuguese ambassador, who was executed for an atrocious murder during the protectorate of Cromwell in 1654, was no exception, as he was not "joined with his brother in the same commission." See AMBASSADOR, EMBASSY. The arrangement of international ceremonies belongs to the subject of diplomacy. To treat it in detail would lead us far beyond our limits, and we must content ourselves with remarking a few of the customary and conventional modifications which affect the general principle of international law by which all independent states are held to be equal.

The subject of maritime ceremonies accorded to diplomatic and other national representatives will be treated under its respective heads. They consist of salutes either with cannon, or with the flag or pendant, by furling it, lowering it, or pulling it down. There is also a salute with sails, which generally consists in lowering the foretopsail. Maritime ceremonials are usually made the subject of express compact, but, as a general rule, on the open seas, a ship carrying a pendant salutes a ship of a friendly power carrying an admiral, and detached ships generally salute fleets. The President of the United States is saluted with 21 guns; the Vice-President with 17; governors of states and cabinet officers with 15; foreign ministers and ministers of the American diplomatic service with 13. The United States national salute is one gun for each state in the Union. See SALUTES.

Royal honors are enjoyed by the empires and kingdoms of Europe, including the Swiss confederation, the grand duchies of Germany, and, amongst Catholic states, by the pope; and the same right extends to the United States of America. These, along with other rights of greater importance, include the right of taking precedence of the others in all international ceremonials. Amongst those who enjoy royal honors, the order of precedency, after much discussion, was left by the congress of Vienna on the ancient footing of custom merely. The rule thus fixed is said to be the following: Monarchs enjoying royal honors, but not crowned heads, yield precedence to those who are, whilst they enjoy it over all other monarchs, demi-sovereigns, and rulers of dependent states. This rule leaves the relative rank of the crowned heads and other classes amongst themselves undetermined, and a curious expedient has been found for obviating the necessity of a minuter classification. By what is called the *alternat*, the rank and places of the various powers are changed from time to time in a certain order determined by lot. If there are several parties to a treaty, for example, a corresponding number of copies is made of it, the name of each state being named first in the copy which it preserves, and the others in the order determined by the *alternat*. But the right to alternation has sometimes been a subject of contention. In 1742 it was refused to Prussia by Great Britain; and Hungary and Sardinia had great difficulty in obtaining it at the peace of Aix-la-Chapelle. All diplomatic agents are of one of the following grades:

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Ambassadors, ministers penipotentiary, charges d'affaires, envoys, and consuls. In the United States, these agents are appointed by the president, with the advice and consent of the senate. If a vacancy occurs while the senate is not in session, the agent may enter upon his duties upon the appointment of the president, subject, however, to confirmation or rejection by the senate at a future time. In practice, the secretary of state, under the direction of the president, takes charge of the diplomatic relations of the government, giving to the agents their instructions and keeping himself in close correspondence with them. In great emergencies it is not unusual for nations to appoint special commissioners to settle a special difficulty, or to draft a particular treaty. In the United States, the necessity and utility of keeping ministers residing at foreign courts has sometimes been questioned; but the practice is continued in the belief that it is favorable to peace between nations by affording facilities for prompt explanations of disputes as they may arise, and also because it is thought that American citizens traveling or residing in foreign countries often need such protection or advice as only a minister or consul is qualified to give. There can be no doubt that diplomatic intercourse, regularly established and maintained, begets between nations sentiments of mutual respect and forbearance, and tends to keep alive that feeling of universal brotherhood which is the richest and ripest fruit of a Christian civilization. It is the duty of a foreign minister to study the institutions, habits, and even prejudices of the nation to which he is accredited, and to keep his own government advised of every movement affecting its peace and welfare. It is also his duty to convey information to foreigners in respect to the government and people of the nation which he represents, in order to abate or remove national prejudices and awaken fraternal feelings. Of late years, American consuls have done the country a valuable service by gathering information as to the productions, manufactures, and trade of foreign nations, and finding new markets for the products of American industry. See Bernard's *Lectures on Diplomacy* (1884) and the article PRECEDENCE.

DIPLOMATICS, the science of ancient writings. The term can scarcely be said to have been at any time in general use in this country, and even on the continent it has latterly given way to the more convenient and descriptive term, paleography (q.v.).

DIPLOP'TERUS, a genus of fossil ganoid fishes, four species of which have been discovered in the old red sandstone, and two in the carboniferous series. They have heterocercal tails, with double anal and dorsal fins, opposite each other, but having the dorsal pair a little apart. The head is large and flattened, and the teeth are fewer and larger than in the allied genera. The scales are perforated with small foramina.

DIPPEL'S ANIMAL OIL, called also empyreumatic animal oil, or rectified oil of hartshorn, is prepared by the destructive distillation of bones in close vessels, when bone-black (q.v.) is left in the retort or vessel, and the crude oil distills over into a suitable receiver. When obtained in this manner, it is a thick viscid oil of a brown color, and a very disagreeable odor, but on redistillation it may be obtained limpid and colorless. Air and light affect the pure or rectified oil, and render it colored and somewhat viscid. Its elementary constituents are carbon, hydrogen, nitrogen, and oxygen, and it contains a number of volatile organic bases, such as aniline, picoline, etc. D. A. O. is a powerful medicinal agent, and when swallowed in doses of a few drops, it is antispasmodic, and stimulates the vascular and nervous systems. In large doses, it is a powerful irritant poison.

DIPPER, *Cinclus*, a genus of birds of the thrush family (*merulidæ*), distinguished from the other birds of that family by an almost straight, compressed, sharp-pointed bill, and still more by their manners and habits. They frequent clear pebbly streams and lakes, feeding chiefly on mollusks and on aquatic insects and their larvæ, which they seek even under water, diving with great facility, and moving about for a short time at the bottom of the water. They carry their rather short tail elevated after the manner of wrens, which they also resemble in their "frequent becks" or dipping of the head, accompanied with an upward jerking of the tail. One species is found in Britain, the COMMON D., or WATER OUSEL (*C. aquaticus*), a bird rather smaller than any of the British thrushes, of a generally dark-brown color, with throat and upper part of the breast pure white. It is found throughout the whole of Europe and the n. of Asia, but chiefly in hilly or mountainous districts. It is not gregarious. The D. never fails to attract notice, as it sits upon some stone in the midst of or beside the stream, its white breast rendering it conspicuous as it repeats the movement from which it derives its name. It builds a very curious nest of interwoven moss, domed and with the entrance in the side, usually in some mossy bank close by a stream, and often near or under a cascade. The assertion which has been made, that the D. walks without apparent muscular effort at the bottom of the water, is incorrect; its feet are not well formed for walking, and it moves under water by means of its wings—which are short—not without much muscular effort. The statement also often made, that it eats the spawn of salmon and other fishes, in the belief of which it is much persecuted in Scotland, has never been sufficiently authenticated. Other species of D. are found in Asia and North America. In Scotland, the D. is called the water crow.

DIPPING-NEEDLE. If a magnetic needle be supported so as to be free to move vertically, it does not at most places on the earth's surface rest in a horizontal position, but inclines more or less from it. If the vertical plane in which the needle moves is the magnetic meridian of the place, the angle between the needle and the horizontal line is

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called the dip or inclination of the needle. The dip of the magnetic needle at any place can be ascertained with very great exactness by means of the dipping-needle. It consists of a graduated circle fixed vertically in a frame, and moving with it and a vernier on a horizontal graduated circle. This last is supported by a tripod furnished with leveling screws. At the center of the vertical circle, there are two knife-edges of agate, supported by the frame, and parallel to the plane of the circle. The needle rests on these knife-edges by means of two fine polished cylinders of steel, which are placed accurately at the center of the needle, and project at right angles from it: so adjusted, the needle moves with little or no friction. It is so made, moreover, that before being magnetized it remains indifferently in any position; after magnetization, therefore, the dip which it shows is wholly due to the magnetic influence of the earth.

In order to understand how an observation is made with the dipping-needle, we must regard the directing force of the earth's magnetism exerted upon the poles of the needle in any vertical plane in which it may happen to be, as resolved into two forces, one acting at right angles to the plane, and the other acting in the plane. There being a corresponding but opposite force at each pole, we have thus two statical couples acting on the needle—one tending to turn it at right angles to the plane in which it moves, and the other tending to bring it round to a position in the plane such that the needle and the forces of the couple may be in a line. In the dipping-needle, the mode of support completely neutralizes the first of the couples; and the position that the needle takes in any plane is due wholly to the second. When the plane of the needle is at right angles to the magnetic meridian, the forces of this latter couple act vertically, and bring the needle to the same position. This, then, gives us the means of determining the magnetic meridian, for we have only to bring the vertical circle round till the needle stands at 90° to put it in a plane at right angles to that meridian; and then by moving the vernier on the horizontal circle over 90°, we place the upper circle and needle in the plane of the magnetic meridian. The dipping-needle thus serves the purpose of a declination needle (q.v.). In bringing the needle round from the plane at right angles to the magnetic meridian, the dip is less and less, till it becomes least in the plane of that meridian. We might thus also find the magnetic meridian, for it is that plane in which the dip of the needle is least. When the needle is in the plane of the magnetic meridian, the couple which acts in other vertical planes at right angles to them disappears, and the whole force of the terrestrial magnetism acts at each pole of the needle, forming a couple which swings the needle round till it stands in a line with itself. The degree on the circle then pointed to by the needle is the dip at the place of observation. Two readings are necessary, for the reason stated in the DECLINATION NEEDLE. One reading is taken, the needle is then reversed so as to change its supports, and then a second reading is noted, and the mean of the two gives the correct reading. The position of the needle when the dip is read off is manifestly the same that a needle suspended in air, if that were possible, and free to move in any way, would finally assume. In resolving, therefore, the total directive force of the earth as we have done above, we must keep in mind that it always acts parallel to the direction of the dipping-needle.

The direction and intensity of the earth's magnetism may be roughly represented by supposing that there is a magnet at the centre of the earth whose length is very small in comparison with the earth's diameter, and which makes an angle of about 20 degrees with the earth's axis of rotation. A line passing through the earth coinciding with the length of the magnet would mark the north and south magnetic poles on the surface of the earth. The magnetic equator would therefore be a circle around the earth perpendicular to the magnetic axis, making an angle of about 20 degrees with the geographical equator. The supposition of a central magnet is known as Biot's hypothesis and leads to the same results as the supposition that the earth is a uniformly magnetized sphere. The actual phenomena of terrestrial magnetism, however, are much more irregular than would be the results of this hypothesis. Besides the change of dip from the magnetic equator to the magnetic poles, there is considerable change of dip from time to time at any one place. The dip in Paris was 75 degrees when it was first observed in 1671, and from this it had fallen to 66 degrees in 1868, since when the variation has been scarcely sensible.

DIPSA'CEÆ AND **DIPSACUS.** See TEASEL.

DIPSAS (Gr. a kind of serpent), a genus of non-venomous serpents of the family *colubridæ*, of very elongated form, and with a thick, broad, and obtuse head. They are tree-snakes, inhabitants chiefly of the warm parts of Asia and America. One species only, *D. fallax*, somewhat doubtfully referred to this genus, occurs in the s. of Europe. Some of the species are of great size. A large and beautiful species is found in Java and Sumatra. The form is more attenuated than in others of the genus.

DIPSOMA'NIA (Gr. *dipsa*, thirst, and *mania*, madness, or eager desire) is a term intended, whether correctly or not, to denote a condition in which certain individuals manifest an irresistible craving for alcoholic drinks. OINOMANIA (Gr. *oinos*, wine), used by German writers; and the English DRINKING INSANITY, are also intended to designate the same state It is of importance to distinguish dipsomaniacs from ordinarily intemperate and drunken individuals. In our streets and in society, we are only too familiar with the various phases of the habit and vice of drunkenness, and the different grades and circumstances of drinkers, such as the morning dram-drinker; the jolly social drinker; and the individual who, knowingly and intentionally, gives himself up to a debauch. While many thus of their own choice degrade and injure themselves, they are

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generally able, for a time at least, to perform tolerably well their usual occupations during business hours. Many hard drinkers can exercise wonderful control over themselves, choosing the time to drink and the time to keep sober; and while sober, can discharge all their family, professional, social, or even religious duties—so far at least as outward appearances go. Some of them may drink continuously, until attacked by what is called *delirium tremens* (q.v.), or fall into the state of *delirium ebriosum* (q.v.), or what has been called *mania a potu;* but when the supplies are stopped, and the necessary treatment is undergone, they are soon able to resume their usual duties, and too soon, in general, their former practices.

There is, however, especially in persons of a nervous and sanguine temperament and constitution—and more readily in women than in men—a condition in which the mere vice is transformed into a disease, the vicious habit into an insane, impulsive propensity, and then the drunkard becomes a dipsomaniac. The alcoholic principle, by habitual abuse, perverts the action, if not the nutrition, of cerebral matter; and the frequent disturbances of the mental functions from fits of intoxication, the loose and irregular habits engendered, and the alternate states of remorse and attempts to drown conscience by more copious libations, all combine to create the dipsomaniac. He loses entire command over his will; has no power to resist the craving for alcoholic stimuli; and is transformed into the involuntary slave of an insane propensity. Physically, the dipsomaniac has a lamentably broken-down aspect; limbs feeble and tremulous; visage pale, leaden-colored, or sodden; and eyes watery and lusterless. But in the manifestations of mind and heart, the change is still more sad. A process of mental deterioration goes on simultaneously with the habit of indulgence; the main aim of life is how to obtain liquor; capacity for business is limited to the means of gratifying the craving; the precepts of morality and religion, the ties of nearest and dearest kin, have no sway over him; indeed, no consideration, human or divine, will interpose any barrier in the way of gratifying the propensity, whenever it is possible. Nor does he now drink with real relish, socially and convivially, but will swallow spirits, away from society and observation, even as it were a drug; and the only satisfaction derived from the act is, that it secures insensibility to the wretched state of mind which prompts the insatiable desire. When this has gone on for some time, although a suspension of the use of stimulants be imposed by the interference of friends, or the occurrence of an attack either of the form of delirium or maniacal excitement mentioned, yet his mind has suffered so materially, that unless control is exercised over him, and continued for a considerable period, he returns immediately like the "dog to his vomit." His moral feelings become more and more perverted, and his intellectual powers weakened. He is thus rendered either facile or wasteful, and incapacitated for the ordinary business of life; or he is irascible, resentful, or mischievous, and torments and annoys those about him, or commits homicide or suicide; or he becomes decidedly insane. Such is acquired dipsomania. But very frequently it is met with as a disease, *ab origine*—a constitutional, and, in the greater proportion of instances, a hereditary affection. When it takes this character, D. resembles other constitutional diseases; and such cases especially illustrate its affinity to insanity. It is well known that gout and rheumatism, or disease of the heart, may be developed from errors in the mode of living of individuals in whose family connections there is no sign of predisposition; while, on the other hand, these diseases may also exist in virtue of a strong hereditary tendency, without any appreciable infringements of the laws of health. And so also D.; for, while frequently resulting from acquired vicious habit, it occurs likewise from an insane hereditary taint, very frequently visited on children by the sins of their parents, especially if the latter have suffered from repeated attacks of delirium tremens, or have been in reality confirmed dipsomaniacs. Indeed, it has even been met with in the offspring of dipsomaniacs during the years of childhood, and that also in the sudden paroxysmal form. But what goes still further to prove its affinity to insanity, is the well-known fact, that in the family of the dipsomaniac, not only several cases of this drink-craving propensity are often met with, but marked instances of mental disorder in other forms. Some interesting examples of this may be found in the *Edinburgh Medical Journal* for April, 1858, by Dr. Thompson of the Perth prisons. When D. thus occurs from constitutional organization, the disease is assuredly of a worse type than when it springs merely out of the vicious habit of drinking. There is generally more eccentricity of habit and deportment, more perversity of mind and disposition, and more untruthfulness and deceit, which is a remarkably uniform feature in this malady. The victim of it is more unscrupulous in the means employed to gratify the ruling desire of existence; and when the disease is fairly developed, and allowed to take its course unrestrainedly, the moral sense becomes utterly perverted, and the intellect annihilated, so that the affected is readily led to the commission of crimes which would not otherwise be perpetrated, or sinks into a state of complete imbecility or hopeless mania. Whether, therefore, the disease exists in its ordinary phases and intensity from voluntary intemperance; or whether it springs out of the propensity, as a consequence of abnormal organization—and these are sufficiently characteristic to present a marked line of distinction from the ordinary vice of intemperance—the pathological and mental phenomena and results are the same—viz., an insatiable craving for alcoholic stimulants, with complete loss of self-respect and self-control in gratifying the desire, despite all obligations due to God and to man. There are generally also some special features in each case, afford-

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ing additional evidence of decided mental unsoundness. Some of these are wastefulness and senseless extravagance; ridiculous eccentricity of conduct; gross indecency of behavior, and obscenity and profanity of language; tendency to theft of articles of little or no value—often of one class or kind of things; extreme perverseness and vindictiveness of disposition; and impulsive violence, which leads readily to the commission of homicide or suicide.

These, then, are the features, variously combined in different cases (of which many examples could be easily given), which distinguish instances of D. from ordinary drunkenness, and warrant the opinion that the condition described is a form of mental affection—a disease, like any other insanity. Almost all medical men, we believe, now hold this view, or at least that it should be treated as an insanity; and it has of late been very widely accepted by the general public, at any rate by all, without exception, who have come in contact with instances in their own families or among their friends.

If such, then, is a correct view of the case, it follows that special physical treatment must be adopted before moral and spiritual agencies can be expected to operate with any chance of success; and as the dipsomaniac is incapable of governing his own will, and making any effort to subdue his ruling desire, it is evident that he should be placed under the power of others who have the means of controlling him. From the very nature of the malady, however, it is scarcely to be expected that the inveterate drunkard will voluntarily submit to control, or continue under it for a sufficient length of time to receive lasting benefit; and therefore it seems essential, as in the case of other insanities, that legal power, with proper precautions and restrictions, should be available, to secure the possession of his person, and the protection of his property. It is undoubtedly the duty of a good and wise government to provide for such care, when it is so well known that the consequences of unrestrained action may be so serious to the individual chiefly concerned; when families are so often thereby plunged into deep distress or absolute ruin; and when the amenity of society is so frequently outraged by a display of mischievous eccentricity, or glaring indecency, or by the occurrence of some flagrant crime. "The liberty of the subject" is a precious trust, but the absence of law to meet the case of the insane drunkard, is in reality license for evil, since no precaution is taken to prevent most grievous infringements of the liberties of others. It is certainly an overstrained delicacy in legislation to shirk interference with a class of cases which lead to so much private misery and public expenditure, as the records of our courts of law, prisons, poor-houses, and lunatic asylums can amply attest. But considering the case of the dipsomaniac from another point of view, a facility by law to control, would confer on himself an unspeakable benefit. It would thus afford him his only chance of cure and restoration to society, instead of permitting him to go on to wreck and ruin. Indeed, the neglect of law to provide such a check and remedy, seems inconsistent, unjust, and inhumane, when we consider that while it permits the insensate drunkard to endanger his life, to waste his property, and deprive his family of that which they are justly entitled to expect from his hands during life, or to fall to them at his death, it holds him responsible for any criminal act he may commit. No doubt the law assumes that he drinks voluntarily, and with his eyes open to all the consequences, and that his practices therefore form an aggravation of his guilt; but such is not the case, for he drinks—as has been shown—involuntarily, and without any reflection as to ultimate consequences; and he is manifestly unable to exercise his reason aright, or govern his will. That the existing law of lunacy does not meet the case of insane drinkers, is well known, and much felt. One would imagine that the definition of insanity—"a person so diseased and affected in mind as to render him unfit to be at large, either as regards his own personal safety and conduct, or the safety of the persons and property of others or of the public" (20 and 21 Vict. c. 71, s. 3); and again, "a person of unsound mind" (25 and 26 Vict. c. 54, s. 1)—recognizes a dipsomaniac as a fit object for control. But the ancient dicta of English and Scotch judges, as to the nature of insanity, still appear to adhere to the legal mind; and as medical certifiers now require to state the facts on which they form their opinion, the statement that one or the chief manifestation is excessive intemperance, or an uncontrollable craving for intoxicating liquors, is quite enough to prevent a sheriff—or at least some sheriffs—from granting the wished-for warrant. He declines to interfere unless there is evidence of some furiosity in the case, or the existence of a delusion; and in all probability, were he to do otherwise, and the case be carried into court, a deliverance would be given against the plea of insanity. At any rate, the uncertainty in the administration of law in such cases, and the danger of subjection to annoyance and expense, even did they gain their plea, deter medical men from granting certificates, which, otherwise, they would most unhesitatingly do. In the last lunacy amendment act (29 and 30 Vict. c. 51, s. 15, 1866), as permission is given to the superintendent of any asylum, with assent, in writing, from one of the commissioners in lunacy, to admit as a boarder any person wishing to submit himself to treatment—whose mental condition is not such as to warrant certificates of insanity—it was supposed likely to open a door for the admission of dipsomaniacs. But it has only in a very few instances, and for a very brief period of time, been taken advantage of, under the temporary pressure brought to bear on them by friends, etc. Indeed, there is the same difficulty in getting individuals to go voluntarily into private sanatoria, refuges, and boarding-houses for inebriates—where no legal steps are available—or, when admitted, to detain them sufficiently long so as to effect a cure.

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Establishments for inebriates, on a small scale, have existed in Gt. Britain for many years; and there are at present several excellent ones, for the middle and upper classes, in various parts of the country, particularly in the counties of Argyle, Ross, Inverness, Forfar, and Perth; besides, several medical men, clergymen, and farmers throughout Scotland receive one or two boarders of this class. Into these places, however, only a very few individuals go quite voluntarily; in fact, it is generally under more or less constraint Straitened circumstances, bodily suffering, the tears and entreaties of relations, threatenings of being cast off altogether, and such-like influences, may succeed perhaps in one out of ten or twelve instances; but abstinence from drink, judicious medical treatment, good diet, pure air, exercise, occupation, and amusement, so improve the physical condition, that ere-long, and before deeper and more radical changes can be effected, or the tone of the moral feelings restored, they become restless, and demand liberty as a right, which they know well cannot be disputed. Out in a few weeks or months, therefore, fully three fourths of those admitted go, or are taken by injudicious or timid friends, and the result may easily be imagined. Years rather than months of control, and gradual trials of liberty on probation, are necessary to effect a permanent cure in any considerable proportion of the more confirmed cases of this malady. Taking into consideration, therefore, these uncertainties, there is evidently not much inducement for parties to invest money in the establishment of a desirable and trustworthy institution. For a good building, in a pleasant and salubrious situation, with some ground attached, must be secured; the furnishings must be comfortable, the cooking good, and considerable opportunities must be provided for within-door and out-door occupation, amusemen . and cheeriness. In fact, all the arrangements must be made so as to provide such now and relishable enjoyments as will counteract or take the place of the cravings for alcoholic stimuli, and prevent, as much as possible, discontentment with the situation in which they are placed. Admission to such private boarding-houses is generally at the rate of £100 per annum. The chief stipulations made on entrance are, that no pocket-money be allowed; that no stimulants are to be given, unless under medical direction; and that intimation be made at all hotels, taverns, or spirit-shops in the locality, that no debts will be paid for drink furnished to the boarders. The only public institution in Great Britain for the treatment of inebriates is the Queensberry Lodge, Edinburgh, in connection with the house of refuge. It is a handsome building, erected some years ago, and comfortably furnished so as to accommodate 27 female boarders of the better classes, at the rates of from £40 to £100 per annum. Already a considerable number have been admitted; and in several instances apparently with excellent results, notwithstanding the difficulty experienced in the most of cases in detaining boarders a sufficient time.

In several cities of the United States of America, and as far back as 30 years, somewhat similar institutions are in active operation, some of them amply endowed, others partly supported from public funds, although into all the admissions are mostly voluntary. Of these there are now upwards of 12 homes or retreats; and the Boston "Washingtonian home," is pointed to as a model institution. But the institution about which we have heard most is the New York state inebriate asylum, at Binghamton. It is a massive and costly structure, sufficient to accommodate about 200 individuals, amply state endowed and possessing every arrangement and appliance for the treatment of the unfortunate class requiring its aid. Here an average of 40 per cent of the cases admitted are said to have been cured It is evident, however, from the number of boarders reported as annually undergoing treatment in these various American retreats, that they receive all sorts of drunkards; and we fear that the good accomplished must, in a large proportion of instances, be only partial and temporary. Thus, in the Washingtonian home, which—according to one of its reports—has accommodated an average of about 18 persons daily, and is said to have had from 250 to 300 cases annually under treatment, the necessarily brief average residence of each holds out little hope that much lasting benefit can have resulted in cases at least of such confirmed inebriates as we have described under the name of dipsomaniacs, and for whom legislation is desirable. It is supposed, however, in America, that these state-supported institutions have been economical by keeping inebriates out of the alms-houses, etc., and in restoring about one third of bread-winners to honorable citizenship, and thus preventing them and their families from falling as a burden on the state. In 1870, an "association for the cure of inebriates" was formed, composed of physicians, superintendents, and friends of inebriate asylums, which has ever since been most active in its operations, and done much by meetings, publications of transactions, and otherwise, to help forward the philanthropic movement, and in every particular on the lines of this paper.

The Americans are in advance of all in legislation regarding the care of the person and property of inebriates; for to the magistrate, or rather judge, is committed the care and custody of all insane persons, and of all persons who are wasteful and incapable of conducting their own affairs, in consequence of habitual drunkenness; and he is empowered to provide out of their estates for their safe keeping and maintenance, and for the maintenance of their families and the education of their children. Hence, it might be inferred that legal power might enforce the care and treatment of insane drinkers in lunatic asylums, or in reformatory asylums, such as those at Binghamton or Boston. Yet such powers are not often called into effect, doubtless from the knowledge that such exists, and that the best course is to submit voluntarily and prevent further proceedings

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Freedom of legislation is more natural in a new country, where antiquated precedents and prejudices do not drag the wheels of reform, and where common-sense views of social interests prevail. Accordingly, in southern Australia a great step was taken in the right direction, chiefly through the exertions of Dr. M'Arthy, of Melbourne, who had considered with lively interest the discussions which took place in this country regarding the treatment of dipsomaniacs, after the publication of papers on D. by Dr. Peddie in 1858 and 1860, and a lecture by sir Robert Christison in 1861. In 1867, after a full ventilation of the question, the government carried a measure placing inveterate inebriates in the same category with insane persons, and providing for them in connection with a lunacy amendment act. But this was soon found to be a mistake, and accordingly in 1872 "an act" was passed "to provide for the treatment and cure of inebriates." The government did nothing in the way of grants towards this object; but the Melbourne retreat, founded for upper-class boarders, notwithstanding financial difficulties at first, is now doing good work.

In Scotland, a conviction has long since been felt that some law was absolutely necessary to meet the cure of insane drinkers; and in 1857 and 1861, the commissioners in lunacy gave utterance to most decided views to that effect. Some with them have thought that provisions of this kind should be embodied in a lunacy act. But there is good ground for holding that the case requires special legislation; and that separate asylums, sanatoria, reformatories, or by whatever name inebriate institutions may be called, should be provided and licensed for this class of the unsound in mind. Interference with personal liberty would thus be more in accordance with the delicacies of the case, less painful to the feelings of those chiefly concerned, and more likely to secure the humane and remedial objects contemplated. Besides, the arrangements proposed would greatly relieve ordinary asylums, and apart from this, the malady itself could in many respects be much better treated when separated from other insanities.

Were sufficient facilities afforded, under government sanction, for the control of dipsomaniacs, and their detention until fit for liberation, there is no doubt numerous institutions—and better than those hitherto existing on voluntary enterprise—would spring up in various parts of the country, to accommodate individuals of all grades of society. Institutions so licensed, and endowed with necessary powers, would not only be productive of much public good, but be remunerative. Even supposing it necessary that government should establish three or four inebriate asylums in central situations of the country, these would soon be found to a great extent to be self-supporting, while they would assuredly lessen the burdens of the country otherwise, by the diminution of disease, destitution, and crime. Parochial boards, too, might send their inveterate drunkards into such asylums with more benefit and more economy than they can keep them in the wards of a workhouse.

To remove objections, two points must be attended to. The first is, that careful inspection of the proposed institutions be made by commissioners appointed for the purpose, so as to secure that all necessary humane and remedial arrangements be properly carried out, and no one detained longer than is essential for recovery; and the second is, that they, along with the medical superintendents, should decide when inmates, although still under control, are sufficiently sane to execute any testamentary deeds, or to conduct other business matters, or to perform—under more or less surveillance, of course—any external civil privilege; or when they may be allowed probational leave of absence, as a preliminary step to final liberation.

In 1870, Mr. Dalrymple, M.P., took up the foregoing views warmly, and in the following year introduced his first bill. On the second reading a select committee was appointed to inquire into the whole subject; and a great mass of testimony borne by magistrates, governors of prisons, medical men, superintendents of lunatic asylums, and of inebriate asylums in America, was taken, and has been given at full length in the blue-books.

In the following session, Mr. Dalrymple brought in his second bill, founded on the report of the aforementioned committee, which strongly recommended the adoption of certain legal provisions of a mixed reformatory and punitive character; but the death of Mr. Dalrymple shortly afterwards arrested the further prosecution of any measure on this subject before parliament. However, a subject of so much importance and general interest was not likely to be altogether pushed aside and forgotten; and accordingly it was revived and warmly agitated in 1874–75 by various branch associations of the British medical associations; and a further impulse given to it by the paper read by Dr. Peddie at its meeting in Aug., 1875, and the discussion which followed. The practical result was the formation in London of a "Society for Promoting Legislation for the Control and Cure of Habitual Drunkards," with lord Shaftesbury as president, and a long list of church dignitaries, members of parliament, and others as vice-presidents and other office-bearers. The society set at once to work to frame a bill on the basis of the select committee's report; and Dr. Cameron, M.P., took charge of it, but too late for the second reading. A new bill was thereafter drawn and introduced in 1879 by lord Shaftesbury in the house of lords and Dr. Cameron in the house of commons, through both of which it had an easy passage. This is not difficult to understand, as its provisions are so mild, and its character so different from that desired by those who had given most attention to the subject, that it was not thought worth any active opposition. The emasculations of the select committee's report, of Mr. Dalrymple's bills, and Dr. Cameron's first bill,

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may be at once understood, when it is mentioned that the mental phase of habitual drunkenness is kept in the background; that the existence of retreats is merely sanctioned, but when erected, to be regulated and inspected, and that admission is never to be compulsory, but only permissive, although some power of detention is given. No wonder that the last report of the society mildly says: "The 'Habitual Drunkards' act,' as passed, does not quite come up to the expectation of your committee, but they congratulate all interested in the reformation of the inebriate on the affirmation by parliament of the principles on which the act is based;" and again: "Your committee have every confidence that, provided only adequate opportunity be afforded, many confirmed drunkards will gladly avail themselves of the power of isolation for a time from the many temptations by which they are at present surrounded."

DIPTERA (Gr. two-winged), an order of insects, which received from Aristotle the name it still bears. Its distinguishing characters are so obvious that it has been acknowledged, with little change of its limits, by almost all naturalists. FLY is a popular name very generally applied to dipterous insects, and often with some distinguishing prefix (as house-fly, flesh-fly, blow-fly, bot-fly, crane-fly, etc.), although it is sometimes used with such prefix to designate insects not belonging to this order (dragon-fly, day-fly, May-fly, etc.). Midges, gnats, and mosquitoes are also dipterous insects. In the number of species which it contains, this is one of the most extensive orders of insects: some of the species are also remarkable for the immense multitudes in which they appear; and although most of them are of small size, and few attract us by brilliant hues, not a few are important on account of the annoyance or mischief which they cause, either in their perfect or in their larva state; whilst many of their larvæ (maggots) are also very useful in consuming putrescent animal matter, which might otherwise prove a source of pestilence.

The D. have only two wings, which are membranous and simply veined. A little behind the wings are two small slender organs called *halteres*, poisers, or balancers, the use of which is not well known. They are usually present even in those exceptional insects of this order in which the wings are not developed. The head of the D. is generally in great part occupied by the large compound eyes, which often contain thousands of facettes; and besides these, three simple or stemmatic eyes (ocelli) are often also present, placed upon the crown of the head. The mouth is formed exclusively for suction, and is usually furnished with a short membranous suctorial proboscis, composed of parts which represent, although so differently modified, the portions of the mouth in coleopterous and other masticating insects, some of the parts, however, often disappearing. The proboscis of many is capable of piercing the skins of animals on the juices of which they feed; others are quite destitute of this power of piercing. Many feed chiefly on saccharine and other vegetable juices. In some genera, the perfect insect seems destitute of a mouth; and the term of life, after the perfect state has been attained, very brief in some, appears to be brief in all. The power which many dipterous insects possess of walking even on very smooth surfaces, in any position, even with the back downwards, familiar to every one in the example of the common house-fly, has not yet received a sufficient explanation. The opinion that their feet are furnished with disks for the formation of a vacuum, has been called in question, but nothing satisfactory has been substituted for it. The terminal rings of the abdomen in the females of many species, form an ovipositor capable of piercing the substances in which the eggs are to be laid, and composed of pieces which may be exserted or retracted into one another like those of a telescope. The eggs are very generally deposited in putrescent animal substances, but those of some kinds in the bodies of living animals, some in vegetable substances; the larvæ of some live in water; the eggs of a few are hatched within their own bodies, and the larvæ of some even remain there till they pass into the pupa state. All the D. undergo a complete metamorphosis. Their larvæ are destitute of true feet, although some of them have organs which serve for the same purpose; some have a distinct head; but others have the head soft and changeable in form, capable of being retracted into the body, and distinguishable only by its position, and by the organs of the mouth. Those which dwell in water or in fluid putrescent matters, have a retractile tail-like prolongation of the body, terminated by a radiated expansion, which communicates with air-tubes, and constitutes part of a very remarkable respiratory system. The larvæ of some D. spin cocoons when about to pass into the pupa state; but in others, the skin of the larva hardens and encases the pupa; the perfect insect making its escape by forcing off with its head the end of its pupa case. See illus., INSECTS, vol. VIII.

DIPTERA'CEÆ, or DIPTEROCARPA'CEÆ, a natural order of exogenous plants, consisting of beautiful and majestic trees, natives of the East Indies. Some trees of this order, of which about 50 species are known, are highly valuable as timber-trees. Among them is the Sal (q.v.), the most esteemed timber-tree of India. They abound also in balsamic resin, and their resinous products are used for a variety of purposes. See ANIME, CAMPHOR, COPAL, DAMMAR, VARNISH TREE, and SAL.—*Dipterocarpus*, the genus from which the above order has received its name, contains several species of the noblest trees of India. They abound in the warm parts of the e. coast of the bay of Bengal and the eastern peninsula. The wood is used for house-building, ship-building, etc. *D. turbinatus*, the GURJUN or GOORJUN TREE, the species by which the genus

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first became known, often attains a height of upwards of 200 ft., and a girth of 15 ft. It has a pale-gray trunk, rising without a branch till it forms at its summit a small symmetrical crown. The leaves are broad, glossy, and beautiful; the flowers in white racemes, but not conspicuous. The wood is hard, close-grained, and durable. A fragrant oil exudes from the trunk, which is extremely valuable for pitch and varnish, and is also used medicinally. It is procured by cutting transverse holes in the trunk, pointing downwards, and lighting fires in them, which causes the oil to flow. The tree is sometimes called the WOOD-OIL TREE. This oil or balsam is also procured from other species of *dipterocarpus*. *D. trinervis* yields a resin which is valuable for plasters, and acts on the mucous membranes like balsam of copaiva. The Javanese smear banana-leaves with this resin, which burn as torches, with a pleasant odor and white light.

DIPTERUS, a genus of fossil ganoid fishes, peculiar to the old red sandstone, in which two species have been found. They derive their name from their most striking characteristic—the double anal and dorsal fins, which are opposite to each other. The head is large and flattened, the teeth subequal, the scales perforated by small foramina, and the tail heterocercal.

DIPT WARE, ornamental brass work, brightened by annealing, by pickling in old or dilute nitric acid until the scales can be removed from the surface, by scouring with sand and water, and finally by plunging for an instant into a bath of pure nitric acid. If nippers are used for dipping, they must be of brass, not of iron or wood. The brass may be bronzed or colored violet, chocolate, olive-green, steel-gray, blue, and black, instead of being merely brightened, by substituting various chemical compounds for the pure nitric acid—nitrate or perchloride of iron being used for simple bronzing.

DIPTYCH (Gr. *diptycha*), a double writing-tablet, or two writing-tablets, which could be folded together. Herodotus speaks of such a tablet, made of wood and covered with wax. It was in the later Roman time, however, that they were most used, and those which have been preserved belong chiefly to the period when classical was merging into mediæval life. The beautiful carving with which they are often covered on the outside, consequently represents not unfrequently a combination of classical and of Christian subjects. Ivory and metal were sometimes employed in place of wood; but the construction was always the same, the wax with the writing being in the inside. Under the emperors, diptychs were distinguished into consular and ecclesiastical. The former, which were presented by the consuls and other magistrates to their friends, and those officially connected with them, on their entrance on office, were inscribed with their names and bore their portraits. The ecclesiastical diptychs, on the other hand, are decorated with scenes from sacred history, and were preserved in the churches as part of the sacred ornaments. Those that exist are of various sizes, rarely exceeding 8 in. by 4. See TRIPTYCH.

DI'PUS. See JERBOA.

DIR'CE, in Greek legend, the personification of a fountain (and stream) at Thebes, from the water of which Hercules derived a part of his strength, and which was usually identified with the fountain of Ares in the legend of Cadmus. Besides the fountain, there was the grove of Dirce, at which sacrifices for the dead and other rites were performed. According to the story, Dirce, the wife of Lycus, king of Thebes, had sorely persecuted Antiope, who at last escaped to Mt. Cithæron, where her twin sons, Amphion and Zethus, were being brought up by a herdsman who was unaware of their parentage. Mother and sons met, but had not recognized each other, till Dirce, who had come to a hill for a Dionysiac ceremony, proposed that Amphion and Zethus should tie Antiope to the horns of a wild bull to be dragged to death. They were about to do so, when the herdsman announced their relationship, and they then tied Dirce to the bull instead. She was dragged over the hill, where she was transformed into a fountain.

DIRECT AND RET'ROGRADE. In astronomy, the motion of a planet is said to be direct when the planet goes forward by its proper motion in the zodiac according to the succession or order of the signs (i.e., from w. to e.), or when it appears to do so to an observer. On the other hand, it is said to be retrograde when it appears to go the contrary way.

DIRECTOR, persons chosen to act as a board of managers to control the affairs of joint stock corporations, such as banks, railway companies, insurance companies, manufacturing corporations, water and gas companies, and the like. The degree of responsibility attached to the office differs somewhat in the several States as defined under their statutes; under the common law the director incurred no special personal liability and was bound only by the ordinary laws against fraudulent dealings; under the special English statutes known as Joint Stock Companies Acts, the duties and responsibilities of directors are very clearly defined. Here it has provided that if the directors of a company declare a dividend when the company is within their knowledge insolvent, or declare a dividend to pay which would to their knowledge make it insolvent, they shall be personally liable for the debts of the company to an amount equal to the dividend declared under such circumstances; in the United States the common law on this point generally prevails. It is customary to pay directors a slight fee for their services, but this is usually insignificant in comparison with the interests

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involved; usually the motive of the director in the matter is the prosperity of the concern, as benefiting him in the position of a stockholder; for the directors are almost invariably chosen from the stockholders; in England this is obligatory, in the United States, though not obligatory by law, it is an established custom rarely if ever violated. Generally speaking, the directors have authority to do any act in the line of the legitimate business of the corporation which the company may itself do under its charter, but they may not totally change that business, nor dispose of what is essential to it without the consent of the stockholders. Directors are usually chosen to serve for the term of one year. In boards of bank directors in England a distinction is made between ordinary and extraordinary directors, the former conducting the business in its details, the latter having little to do with the actual business, and in reality being honorary officers, who allow their names to be used to benefit the undertaking by the distinction attached to them from personal or financial position. This practice is not common in the United States, though not unknown. Courts of last resort in the United States have held that gross neglect of duty by directors resulting in loss to the shareholders, may render the directors personally liable; that they practically stand in the position of trustees for the stockholders, and, like other trustees, they are, therefore, prohibited from using their position of trust for private profit; thus directors may not, as such, make the contracts between their company and themselves personally. The disposition of the profits of a corporation is under most charters left largely to the directors; thus they may, if they choose, apply profits to the extension of facilities or purchase of new plant or other improvements, rather than to dividends, in their discretion, and without a vote of the stockholders.

DIRECTORY. On the death of Robespierre, in 1794, a reaction commenced in the convention itself, as well as throughout all France, against the sanguinary excesses of the Terrorists. Ultimately a new constitution—that of the year 3 (1795)—gave birth to a new government, composed of a legislative body divided into two councils—the council of five hundred, whose function was to propose laws; and the council of the ancients, whose function was to pass them. The actual executive power was intrusted to five members chosen from both sections, and who sat at the Luxembourg. Their names were Lépeaux, Letourneur, Rewbel, Barras, and Carnot. These five constituted the famous *Directory*. They assumed authority in a moment of immense peril. France was environed with gigantic adversaries, while distrust, discontent, and the malice of rival factions made her internal administration almost hopeless. The frantic heroism of her soldiers saved her from spoliation by the foreigner; and had all the members of the D. been patriotic and honest, she might have been saved also from spoliation by her own children. But, on the contrary, the home-policy of the D. was deplorable. The demoralization which had begun to characterize officials even in Danton's time, now seized almost every class. Barras, a representative of all the turpitude of the hour, set the example. The majority of the two councils were equally corrupt; and although there were some both in the councils and D. whose virtues and talents were unimpeachable, yet they were too weak to counteract the knavery of their associates. It soon became clear that France could not be reconsolidated by the fag-ends of the revolution. The power and skill requisite for such a herculean work must be sought for elsewhere, among men who had received a nobler discipline than could be obtained in the political squabbles of the metropolis. Such was the thought of the abbé Sièyes. He turned his eyes to the army, where a host of new and brilliant names had appeared—Hoche, Joubert, Brune, Kleber, Desaix, Massena, Moreau, Bernadotte, Augereau, Bonaparte. Sièyes propounded his plan for the overthrow of the D., and the establishment of a consulate, that should be, in reality, a monarchy under republican forms, first of all to Moreau, who was frightened by its audacity; then to Bernadotte, whose excessive caution hindered him from approving of it; then to Augereau, who could not understand it; and finally to Bonaparte, on his return from Egypt. The last admired the project; a conspiracy was rapidly formed; all those functionaries who had been promised places by the D., but had not received them, offered their aid; and by the *coup d'état* of the 18th Brumaire (q.v.), an end was put to the directory.

DIRECTRIX is a right line perpendicular to the axis of a conic section, in reference to which its nature may be defined. Assume an indefinite straight line as the D. and a point without the D. as the focus. Then, if a line be revolved about the focus, any point moving in the line will generate a curve which will be a conic section when there is a constant ratio between the distance from the point to the focus and the perpendicular distance from the point to the directrix. The curve is an ellipse, a parabola, or an hyperbola, according as the distance from any point of the curve to the focus is less, equal to, or greater than the perpendicular distance from the point to the directrix. The constant ratio referred to is called the determining ratio of the conic.

DIRECTORY FOR THE PUBLIC WORSHIP OF GOD, a code of regulations concerning the different parts of public worship, drawn up by the Westminster assembly in 1644, ratified by the English parliament in the same year, and adopted by the general assembly of the church of Scotland and by the Scottish parliament in 1645. It was on express order from both houses of the English parliament, that the Westminster assembly addressed itself to the work of preparing this directory, to supply the place of the Book of Common Prayer, which had been abolished.

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DIRGE, a solemn piece of funeral music. Its name is derived from the first word of the Antiphon : " Dirige Domine Deus Meus, in conspectu tuo, viam meam."

DIRK is a short dagger which at various times and in various countries has been much used as a weapon of offense.

DIR'SCHAU, a t. in Prussia, in the government of Dantzic, on the Vistula, a railway junction, 20 m. s.e. of Dantzig ; pop. '90 11,897. There is considerable trade and industrial activity ; but the chief claim of the place to attention is the lattice-work iron bridge over the river, built in 1850–57, 2726 ft. long, with six spans of 410 ft. each.

DIs is the Roman name for the god whom the Greek call Pluto or Plutus (q.v.).

DISABILITY, LEGAL, is either absolute, which wholly disables the person from doing any legal act—e.g., outlawry, excommunication, attainder, alienage—or partial, such as infancy, coverture, lunacy, drunkenness, and the like. It may arise from the act of God, of the law, of the individual himself, or of his ancestor, or the person from whom he inherits.

DISASSIMILATION. See NUTRITION.

DISBANDING, in military matters, is the breaking up of a regiment or corps. When peace is proclaimed after a war, and a reduction of the army becomes necessary, this is effected by disbanding or disembodying ; the men are discharged, and the officers are mostly placed on half-pay.

DISBAR, to deprive an attorney, counselor-at-law, or barrister of his privileges as such. In England the power of disbarring a barrister rests with benchers of the inns of court, who have the corresponding power also of admitting the barrister to his rights. The power, however, is very rarely exercised ; sometimes many years pass without a case of disbarring coming before the benchers. In the United States attorneys are admitted to practice by the judges, and accordingly with the judges rests the power of disbarring them. An attorney may be disbarred for unprofessional conduct, such as extortion, or for moral obliquity of a serious kind. Cases of disbarring by the courts of the several States are not altogether rare, but do not occur with great frequency. The motion to disbar in this country is usually made by a committee of the bar association to which the offender belongs, and which has considered the circumstances of the case in committee. The actual proceedings to disbar must take place in open court, and the accused attorney must be given as full opportunity to cross-examine witnesses and to produce testimony in his own favor as if he were an indicted prisoner. It is not an uncommon practice for a disbarred attorney to be restored to practice after having suffered the indignity and injury of being disbarred for some time, if he can convince the court of his repentance and resolve to offend no more.

DISCHARGE. An enlisted man in the army can only be discharged before the expiration of his term of enlistment by order of the President or Secretary of War, by sentence of a general court-martial, on certificate of disability, or by order of one of the United States courts, or a justice or judge thereof, on a writ of habeas corpus. At remote stations soldiers may be discharged a sufficient time before the expiration of their terms to avail themselves of opportunities to return home, if they would otherwise be detained at those stations for a considerable period after discharge. The discharged soldier is furnished with a certificate stating the cause of his discharge. His character is given, and a statement as to whether he is married or not, and the number of his minor children. In order to prevent payment on fraudulent discharge papers, the officer who prepares the final statement of a soldier sends, shortly before his discharge, to the chief paymaster of the department, a notification stating the date of last payment. The soldier's signature is also forwarded, and no discharged soldiers are paid unless the genuineness of the discharge papers and the identity of the claimants are satisfactorily proved.

Enlisted men, apprentices, and boys in the naval service are entitled to their discharge only at the expiration of the term of their enlistment. They may be sentenced by a summary court-martial to be discharged with " bad conduct discharge," but such sentence cannot be carried into effect in a foreign country. Discharge can only be for cause, unless the term of enlistment has expired. Persons claiming to be entitled to their discharge as aliens or minors are obliged to apply to the civil courts. An order from the Secretary of the Navy, or the sentence of a general court-martial, is necessary for the discharge of an enlisted man in a foreign port, unless he should have enlisted outside the limits of the United States. Upon the expiration of the term of enlistment of a person whose detention on board is not essential to the public interest, he may be discharged upon his own request in writing, waiving all claim to transportation at the public expense, by order of the commander-in-chief. Those discharged at their own request before the expiration of their enlistment are not entitled to " Honorable Discharge and Continuous Service Certificates." This is a form of discharge given to men who have enlisted for three years, and whose conduct and efficiency entitle them to it. The ordinary or " small" discharges are given to those who have enlisted for special service, or for general service, and who for any reason are discharged before the expiration of their term of service. A bad conduct discharge is the " small " discharge, with the words " discharged for bad conduct, by sentence of court-martial," written

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across the face and signed by the commanding officer. Any man holding an honorable discharge, who re-enlists for three years, within three months from the date of his last discharge, receives an increase of one dollar per month to the pay prescribed for the rating in which he serves, for each consecutive re-enlistment, in addition to the three months' gratuitous pay known as honorable discharge money. Should he fail to re-enlist within three months from date of last discharge he derives no further benefit.

DISCIPLES OF CHRIST, a denomination of Baptists, organized 1827, who are often spoken of as Campbellites, but prefer to call themselves THE CHURCH OF CHRIST. In 1808, Thomas Campbell, a minister of the "Seceders," emigrated from Ireland to the western part of Pennsylvania, and was followed, the next year, by his son Alexander. They both earnestly desired reforms in the Christian church conforming it to apostolic precept and practice. Their first step was to gather a small company of disciples for the special study of the Scriptures, with the pledge that, rejecting all human creeds and confessions of faith, they would strictly conform their practice to the teachings of the divine word. This virtual separation from the Seceders was followed by the gathering of a small congregation in Washington co., Penn., known as the Brush Run church, of which Thomas Campbell was an elder, and by which Alexander was ordained to the ministry. After what they regarded as a thorough investigation of the question of baptism, both father and son, with five other persons, feeling convinced that the Scriptures taught the "*immersion of believers*," were, June 2, 1812, immersed by a Baptist minister. In 1815, having increased to such a degree that they numbered 5 or 6 congregations, they united with the Redstone Baptist association, having first stipulated in writing that no terms of union or communion other than the Holy Scriptures should be required. As many of the Baptist ministers were, from the first, dissatisfied with this union the reformed congregations at length withdrew and joined the Mahoney (Ohio) association, the members of which regarded the new movement with favor and finally entered heartily into it. In 1823, Alexander Campbell commenced the monthly publication of the *Christian Baptist*, by means of which, together with public oral debates on baptism and itinerant preaching over large districts, his views were widely diffused among Baptists. Opposition to them on the part of many at length resulted in ecclesiastical action; the Dover association of Virginia, 1827, leading in what soon became a general withdrawal of Baptist fellowship from all who held the views of Alexander Campbell. The reformers, as they were called, then formed a separate organization, and have since rapidly increased, particularly in Kentucky, Ohio, Indiana, Illinois, Missouri, and Virginia. They have churches, also, in Canada, England, Wales, Ireland, and Australia. They reported in 1894–5 8768 churches or organizations, and 871,017 members in the United States. Rejecting creeds and confessions of faith, as of human origin, they take the Bible as the sufficient and only authority in matters of faith and practice. Shunning subtle theological speculations, they aim to present Bible truths in Bible terms. This exposed them at first, and in some quarters, to the imputation of holding Unitarian views; but their orthodoxy on this portion of theology is now fully admitted. On the atonement, resurrection, and general judgment they agree with the great body of evangelical Christians. They continue the breaking of bread in commemoration of the Savior's death every first day of the week. They hold that faith and repentance are the divinely appointed pre-requisites for baptism, and that all who do repent and believe may and should be immersed in the name of the Lord Jesus Christ for the remission of sins and reception of the gift of the Holy Spirit. In church polity they are congregational, with three classes of officers: 1. elders, presbyters, or bishops; 2. deacons; 3. evangelists. The last named are the itinerating ministers or missionaries, and are supported by voluntary contributions. Acknowledging their obligation to provide for the wide diffusion of scriptural preaching by well-instructed men, they are zealous in promoting education. They have a university at Lexington, Ky.; and colleges at Bethany, West Va.; Hiram, Ohio; Franklin, Pa.; Indianapolis, Ind.; Eureka, Ill.; and Oskaloosa, Iowa; besides colleges for women and many other schools of high grade.

DISCIPLINE, FIRST BOOK OF, or **OF POLICY,** in Scottish ecclesiastical history, an important document, drawn up by John Knox and four other ministers, in 1560. Along with the confession of faith of the same year, it must be held as exhibiting the principles on which the reformed church of Scotland was originally founded. It lays down rules for the election of "pastors or ministers" by the congregation, their examination by "the ministers and elders," etc., also for the election of elders and of deacons: it recognizes the office of superintendent as then established; but it is most largely occupied with things pertaining to ecclesiastical discipline, strictly so called, and the mode of dealing with persons guilty of offenses. The first book of discipline never received the sanction of parliament, but was subscribed by many of the nobles and barons.

DISCIPLINE, SECOND BOOK OF, or "Heads and Conclusions of the Policy of the Kirk," a document of great importance in the ecclesiastical history of Scotland, adopted by the general assembly in 1578; and, although never ratified by act of parliament, still frequently appealed to as the most perfect and authoritative exhibition of Scottish presbyterianism. The separations which have taken place from the established church in Scotland, have not been on the professed ground of dislike to the constitution exhibited in the second book of discipline, but of anxiety for its perfect maintenance; and this document has recently been adopted as one of the articles of union among

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Scottish Presbyterian churches in Australia. It was prepared with great care by a committee of the general assembly, in which Andrew Melville took a leading part; and in a time of much conflict between the court and the church, concerning the power of the civil government in things ecclesiastical, church government, and patronage (q.v.). It begins by asserting strongly the powers regarded as essentially inherent in the church, sets forth the distinctions between civil and ecclesiastical government and their mutual relations, and lays down a thoroughly Presbyterian platform of church-government.

DISCOB'OLI, according to Cuvier, a family of malacopterous fishes, remarkable for having the ventral fins united to form a sucking disk on the under surface of the body. To this family, also called *cyclopteridæ*, belong the lump-sucker (*cyclopterus lumpus*), the unctuous sucker or sea-owl or cock-paddle *snail*, and or two other British fishes. To this family Cuvier also referred the remora (q.v.), adverting, however, to the different position of the sucking disk, and other important distinctions, on account of which a very different place in the system is now assigned to it. The use of the sucking disk, however, is much the same—that of attaching the animal to fixed substances, so that it may remain and obtain its food, where otherwise it would be swept away by the current. The adhesive power of the sucker, in the larger specimens of the lumpfish, remains after death.

DISCOBOLUS (Gk., *discos*, a quoit, and *ballein*, to throw), a statue by Myron (q.v.), one of the chief sculptors of the Old Attic school, known from several copies, the best of which is a life-size statue in the Massimi palace at Rome. The statue represents the athlete at the moment when, having swung the discus, five pounds in weight, back to the full stretch of his arm, he is straining every sinew to begin the forward motion and deliver the discus with all his strength and with the impetus to be gained from the full weight of his body and the greatest possible stretch of his arm. A cast of the discobolus may be seen in the Metropolitan Museum of Art in New York City.

DISCORD, sounds which have no harmonical relation whatever; differing from dissonance (q.v.), which in musical language is applied to sounds that are in grammatically correct relation to each other, though not consonant.

DISCOUNT, the difference between a sum of money due at a future period and its present value; or the deduction made from the amount of a debt that is paid before it is due. It is usually ascertained—in the case of bills of exchange, promissory notes, and the like—by subtracting from the principal amount its interest, calculated from the date of payment until the date when the amount is due; but this, although sanctioned by usage, leads to an excess of charge, the interest being thus advanced to the lender before it has actually accrued. True discount is computed as follows: Suppose that £100 is advanced for one year at, say 5 per cent, the sum repayable at the end of the year in respect of this advance will be £105; therefore, £100 is the present value of £105 due a year hence; and from this conclusion it is easily deduced by proportion, that the value of £100 due a year hence is £95 4*s.* 9½*d.* Hence the true discount on £100 due in a year at 5 per cent, is £4 15*s.* 2½*d.* The usual formulas are—for the present value, $\frac{100\,A}{100+nr}$; for the discount, $\frac{Anr}{100+nr}$; where "A" is the principal sum due; "n" the time, in years or fractions of a year; and "r" the rate per cent, *simple interest being assumed.* For example, let it be required to find the discount on £97 7*s.* 6*d.*, due seven months hence, at 4½ per cent. Here A=£97 7*s.* 6*d.*=97.375, $n=\frac{7}{12}$, $r=4\frac{1}{2}$; $nr=\frac{7}{12}\times\frac{9}{2}=\frac{63}{24}=\frac{21}{8}$. $Anr=97.375\times\frac{21}{8}$.

$$100+nr=100+\tfrac{21}{8}=\tfrac{821}{8}.$$

Hence the discount is $\frac{97.375\times\frac{21}{8}}{\frac{821}{8}}=\frac{97.375\times21}{821}=\frac{204.4875}{821}=2.491=$ £2 9*s.* 10*d.*

But it is easier first to determine the present value, and hence, by subtraction from the amount due, the discount.

An extension of the above formulas is necessary in computations connected with leases, reversions, etc., to be valued on the stricter principle of compound interest, for which see INTEREST.

By discount is likewise understood the depreciation in value of a fixed investment; as when a railway stock, on which say $100 has been paid, can be sold for $90 only, the "discount" being thus 10 per cent.

The allowance made to a trader, under the name of discount, for prepayment of a debt, is usually greater than the current rate of interest, as the creditor receiving the money before it becomes due, secures himself against the insolvency of the debtor.

The rates of discount vary according to the demand for money and the nature of the security. The range in the U. S. is from 3 to 10 per cent., except in the case of doubtful or unendorsed notes, when a much higher rate is exacted. Notes at and under three months' currency are usually charged a per cent. less than those of a long date. In the Western States high rates are allowed.

DISCOVERY, A BILL OF, is commonly used in aid of the jurisdiction of a court of law to enable the party who prosecutes or defends a suit to obtain a discovery of the facts which are material to such prosecution or defense. The plaintiff must be entitled to the discovery which he seeks, and can have a discovery only of what is necessary for his own title, as of deeds under which he claims, but not to pry into affairs of the

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defendant. The bill must show with reasonable certainty a present and vested title and interest in the plaintiff, and what that title and interest are; must state a case which will constitute just ground for a suit or defense at law, and describe deeds and acts with reasonable certainty. A bill of discovery will not lie in aid of a criminal prosecution, a mandamus, or a suit for a penalty.

DISCUSSION, in Scotch law. By the law of Scotland, all cautioners, unless bound jointly and severally with the principal debtor, were formerly, and cautioners bound prior to the passing of the mercantile law amendment act (21st July, 1856) are still, entitled to insist that the creditor shall call on the principal debtor in the first place; or *discuss* him, as it is technically said. Where the principal debtor fails to satisfy the obligation in full, the creditor was bound to give the cautioner the benefit of such portion of it as he did discharge. D. was not merely a demand for payment, but enforcement of it, in so far as the means of the principal debtor admitted of. Cautioners bound subsequently to the date of the mercantile law amendment act (19 and 20 Vict. c. 60, s. 6), can enjoy the right of D. only by express stipulation.

DISEASE, according to its literal construction, a state of *dis-ease*, or absence of the condition of health, in which all the faculties and organs of the body and mind work together harmoniously and without sensible disturbance. In a strictly scientific sense, there may be disease without pain or uneasiness in the ordinary meaning of these words, but hardly without functional disturbance or incapacity of some kind. It is, therefore, only necessary to include in the definition of disease the diminution of functional power, whether attended or not by suffering, and the scientific and practical ideas of the word will closely correspond. It must be admitted that slight structural and functional deviations from the state of health are sometimes unnoticed; but only because they are slight, and because the functions to which they extend are not habitually in use to the full extent. A great deal of unnecessary obscurity is found, especially in continental writers, in discussing the abstract idea of disease, which has been connected with all the most intangible subtleties of the most abstruse and metaphysical philosophy, by regarding it as dependent upon the idea of life and of the vital force. Many authorities have thus generalized disease into a separate active principle, opposed to, and everywhere seeking to destroy, the principle of health; and Paracelsus was hardly more open to objection on the ground of absurdity than many others of his countrymen, when, in his picturesque and at the same time mystical manner, he endowed the vital principle with a kind of personality, and spoke of disease as due to the whims and caprices of a displeased and resentful Archæus, an idea which was still further developed by Van Helmont. It is common to treat of disease as being *functional* or *organic*; i.e., evidenced by changes of function or of structure; but function and structure are so closely allied in fact and in nature, that the more this distinction is examined the more vague and impalpable it becomes; and it can therefore only be kept up as a provisional and conventional arrangement. The classification and arrangement of diseases according to their external characters has been termed nosology (q.v.); while the observation of their more intimate and less superficial relations in connection with their causes and results, is called pathology (q.v.); both of these sciences, of course, being kept in view in the healing art of medicine (q.v.), of the more practical portion of which they form the pillars.

DISEASES, DISTRIBUTION OF. It is generally known that the different regions of the earth are subject to diseases deriving their character from local circumstances and conditions, such as latitude, climate, the chemical quality of the soil, elevation of the land above the sea-level, variation of temperature, water distribution, character of the vegetation, and the peculiar habits of the people. The science of nosography in this aspect, however, did not receive much attention before the beginning of the present century, and is still comparatively undeveloped, though something has been done in the way of discovering and classifying facts. It is known that tropical regions are the home of malarial fevers, cholera, and hepatic diseases. This is due in part to the damp soil and decaying vegetation, particularly in the river valleys. The yellow fever of the Mexican gulf, though often aggravated by other conditions, doubtless originated primarily from this cause. In the more temperate zones, typhus, typhoid, intermittent, and scarlet fevers are found. They are, however, for the most part, not so much endemic as epidemic. In the northern hemisphere, n. of the tropical zone, catarrhal diseases prevail, while in the corresponding zone of the southern hemisphere they are unknown. Intestinal catarrh prevails, however, to a considerable extent in some parts of the intertropical regions. Nosologists are as yet unable to explain why some diseases prevail alike in widely different latitudes; for example, rheumatism in warm and dry as well as in cold and wet regions; and leprosy in Greenland, Norway, and Iceland, as well as in the tropics. In some cases, hilly regions are ravaged by fevers, while in the intervening valleys fevers seldom occur. The cultivation of the soil, sometimes essentially modifies the character of the malarial diseases. The destruction of forests often results in the introduction of diseases unknown before. Indeed, as a general rule, living vegetation tends to preserve health, while decaying vegetation is a prolific source of disease; but the modifications of this law are very little understood. Defective drainage, natural or artificial, is also a common source of disease, especially in cities and thickly settled towns. The personal habits of races and communities in respect to diet and

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cleanliness, exert a wide influence upon the public health. Europe, on the whole, possesses the requisite conditions of health in greater perfection than any other quarter of the world. The rates of mortality from diseases of the lungs are greater in northern than in southern latitudes. This is illustrated by the prevalence of consumption in the north-eastern portion of the United States. Fevers are more prevalent in the southern than in the northern states. Malarial fevers are especially fatal in the southern regions of the country. They are infrequent, however, where pine forests abound. Knowledge on this subject, as yet fragmentary, is slowly increasing.

DISEASES OF PLANTS form a subject of study interesting equally in its scientific and its economic or practical relations, but in regard to the most important parts of which much obscurity and uncertainty still exists. Enough, indeed, is known to show that, as might have been expected, an analogy subsists between the kinds of disease to which plants are subject, and those of animals, both in their nature and their causes, yet with wide differences, according to the difference between vegetable and animal life.. Plants, like animals, are liable to suffer from unsuitable external circumstances, as of temperature, drought, or moisture, etc.: they are liable, like animals, to suffer from deficiency of food, from excess of it, or from being compelled to subsist on improper kinds of it, or too exclusively on some particular kind. They often suffer much from vegetable parasites, chiefly fungi, and from multitudes of minute animals, which, without eating them up, destroy organs essential to their health, or prey upon their juices. The constitutions of plants are accommodated to particular temperatures, and they neither flourish when the temperature is for any considerable time much above or much below certain limits, very different, however, for different species. Light is of the greatest importance to vegetable life, and a want or deficiency of it speedily produces an unhealthy condition, the proper chemical changes not taking place in the juices of the plant; and this unhealthy condition, sometimes very extensively produced in gloomy seasons, when the deficiency of light is accompanied with excess of moisture both in the air and in the soil, renders plants very liable to the attacks both of vegetable parasites and of minute animal tribes.

Excess of nutriment, causing an extreme rapidity of growth, sometimes produces an unhealthy condition in particular parts of plants, in which a greater amount of tissue is developed in a single season than can be thoroughly matured.—Manures, injudiciously and unsuitably applied, are often productive of disease. Putrescent matter coming in contact with the roots of many plants, is very injurious to them, and causes *canker*.—Contagion, as a cause of disease in plants, if not fully demonstrated, is rendered highly probable by such facts as the memorable prevalence of the potato disease, and the rapid spread of the vine disease (*oïdium*); nor does the existence of particular fungi in the diseased plants materially affect this probability.

With regard to the diseases of plants generally, little has been hitherto found practicable in the way of cure, and prevention is the object chiefly aimed at in all investigations of their nature and causes.

Some of the most important diseases of plants are noticed under particular heads; and some of the most destructive parasitic fungi are described in their proper places in this work.

DISHONOR OF A BILL, in Britain, when the person on whom a bill is drawn declines to accept it or to pay it, he is said to dishonor it. The act of drawing or of indorsing a bill implies an obligation to pay it in the last instance, and the person in whose favor it is drawn has thus recourse against the drawer and indorsers, should the drawee fail to accept or to pay. In order to preserve this recourse, however, it is indispensable that notice of dishonor shall be given to the drawer and indorsers. No particular form of notice is requisite. The notice must be such as to identify the bill, and to inform the party to whom it is given of the protest, a copy of which ought to accompany it. If the notice is put into the post-office, and properly addressed, it is sufficient; and even verbal notice, if clear, will suffice. In the case of foreign bills, the period within which notice must be given is regulated by the usages and customs of merchants. Any delay which can fairly be ascribed to neglect or omission, and is not justified by the circumstances of the case, will be fatal to the bill-holder's claim for recourse. In inland bills and notes, the rule till lately in Scotland was, that fourteen days after the protest was taken should be allowed. This has been altered by the mercantile law amendment act (19 and 20 Vict. c. 60), which provides (s. 14) that notice of dishonor of inland bills and promissory-notes, in order to entitle the holder to recourse, shall be given "in the same manner and within the same time as is required in the case of foreign bills by the law of Scotland." To both classes of bills, then, the English rule is now applicable, which is, that notice must, in the general case, be sent the next day, where the parties reside in the same place, and by the next post, if they reside at a distance.

DISINFECTANTS are a class of substances which have the power of absorbing or destroying the effluvia or fetid odors evolved from putrescent matter, and the miasmatic matter generated in low, marshy, and ill-drained localities. The principal substances capable of being used for this purpose are chlorine, bleaching-powder, carbolic acid, animal and wood charcoal, chloride of zinc, sesqui-chloride of iron, nitrate of lead,

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acetate of lead, and nitrous acid. Chlorine (q.v.), either when used by itself, or in combination with lime, as bleaching-powder, is probably the most powerful disinfecting agent. When liberated into an apartment, it immediately causes the destruction of infectious or other deleterious matters. The mode of its action appears to be principally due to the great affinity of chlorine for the hydrogen of the gaseous compounds evolved from putrefying matter, and in abstracting the hydrogen, the chlorine destroys the organic substance. A simple way of employing chlorine as a disinfecting agent in sick-rooms, and adjacent lobbies and apartments, is to place a thin layer of bleaching-powder upon a plate, from which the carbonic acid of the air will liberate chlorine rapidly enough to be of essential service in keeping down infection, and without causing any inconvenience to the inmates. If a more plentiful supply of chlorine be desired, a little vinegar added to the bleaching-powder will liberate the gas freely. Charcoal is also of great service in removing fetid effluvia. Clothes possessing a disagreeable odor may be deprived of it by being rolled up or placed in a box with charcoal; and a thin layer of the latter strewn over putrefying matter, such as the decomposing carcass of an animal, immediately absorbs the effluvia, and the air above becomes quite sweet. The charcoal acts first by absorbing the odoriferous gases, such as ammonia, hydro-sulphuric acid (sulphuretted hydrogen), etc., and thereafter aids in the oxidation of these into nitric acid, sulphuric acid, and water. As agents capable of being employed in the deodorization and purification of offensive liquids, such as bilge-water and sewerage-water, there are chloride of zinc—Burnett's disinfecting liquid (q.v.)—chloride of manganese, perchloride of iron (Ellerman's deodorizing fluid), and nitrate of lead (Ledoyen's disinfecting fluid); but these liquids are not true disinfectants, and are merely serviceable in deodorizing by *fixation*. The employment of fumigating pastilles, burning brown paper, and fumigations with camphor, benzoin, mastic, amber, lavender, and other odoriferous substances, is merely serviceable in cloaking over the offensive, fetid, and hurtful gases, and should never be resorted to unless in conjunction with the use of other agents possessing the properties of true disinfectants. There has lately been considerable skepticism in regard to the disinfecting powers of chlorine and carbolic acid, and with apparently good reason. Doubtless too much reliance has been placed upon them, or upon an inefficient mode of using them. The mode of action of chloride of lime, or the chlorine or chlorine compounds liberated therefrom, is probably like that in bleaching. The disease-breeding organism is broken up, and consequently its propagating power destroyed, just as coloring matter is broken up. This explanation does not take into consideration, of course, the theory of bleaching which supposed the abstraction of hydrogen by the chlorine compound and the liberation of oxygen in the condition of ozone. The important fact to bear in mind is that the disinfectant destroys the disease germs. Now, to act in this way, it is necessary to have at least one molecule of the disinfectant in the presence of one molecule of the disease-producing organism, and probably it requires several, perhaps a hundred to one. The question then arises how many molecules of matter or how many organic compound particles are there in a given number of disease germs. No positive answer can be given. It is a mere matter, not of guess-work, but of estimation, and involves the question as to how many molecules of the disinfecting material are required to produce the death or disorganization of the disease germs. After a number of experiments, the question can be, and has been, practically decided. It is found that when an apartment is thoroughly fumigated with chlorine, or the compounds liberated by chloride of lime, that disease germs are destroyed. If, however, chloride of lime has simply been strewed about the premises, even in considerable quantity, it is found often that the place has not been thoroughly disinfected. If carbolic acid is used in too weak a solution it may not sufficiently arrest or destroy the vitality of the growing disease germs. To depend upon the fumes of carbolic acid would be a practical fallacy. The substance must be directly applied, as a rule, to have a full sanitary effect. Perhaps chlorine may act by simply killing the germs. Carbolic acid probably does, and some other substances of less power may act upon some disease germs sufficiently, when they are not present in too great quantity, to prevent development of disease. Heat and cold, when intense enough, are perfect disinfectants. The continued application of dry air heated to 150° or 200° will generally destroy disease germs. It doubtlessly desiccates them, and they die. Moist air must be heated to the boiling point to produce the same effect. A sufficient degree of cold will also effect the purpose; how great, cannot be stated for every instance. We know that diphtheria and scarlet fever, particularly the latter disease, often flourish in severe cold weather. The application of cold, except in a limited and partial manner, is impracticable. The mode of disinfecting any given locality must depend upon circumstances, and often requires much judgment. See CARBOLIC ACID, and for Condy's fluid the article MANGANESE, also CONTAGION, INFECTION, BACTERIUM, GERM THEORY OF DISEASE.

DISK, in botany, a part intervening in some flowers between the stamens and the pistil. It seems in most cases to represent an inner whorl of stamens variously modified. It is often a mere ring; sometimes it exhibits a whorl of scales or of rudimentary

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stamens, or even of petal-like appendages; sometimes it rises into a sort of cup around the pistil; sometimes, as in the rose, it assumes the form of a waxy lining of the tube of the calyx. It is often glandular, and secretes a honey-like fluid. It is one of the parts included under the vague comprehensive term *nectary* by the older botanists.

DISK AND **DISCOB'OLUS.** See QUOITS.

DISLOCA'TION consists in the displacement of one bone from another with which it forms a joint (*put out of joint* being the popular expression). Dislocations are generally the result of sudden accident, but may be the result of disease, or may be congenital. The displacement may be *partial* or *complete;* and surgeons classify their cases into *simple* dislocations, when the skin remains unbroken, and compound, when there is a wound by which the external air may communicate with the joint. Occasionally, in addition to the dislocation, there are fractures of the bones, or lacerations of important blood-vessels in the neighborhood; it is then termed a complicated dislocation. Dislocation is a rare accident in infancy and old age, because in the former the joint-ends of the bones are very flexible, and yield to violence; while the aged skeleton is so rigid that the brittle bones fracture under force that would drive younger and firmer ones out of their sockets. Dislocations are most frequent between the ages of thirty and sixty. Persons with weak muscles, and lax, long ligaments, or those in whom the latter have been softened by inflammation of the joint, are predisposed to dislocation. The joints most frequently displaced are the shoulder and the elbow.

General symptoms of a dislocation.—After a blow, fall, or violent muscular exertion, a limb is found to be immovable at the injured joint, there is great pain, and the shape of the part is changed; but soon swelling ensues, and every distinctive mark about it is obscured. If left alone, or merely treated as an inflamed joint, the swelling gradually subsides; but the immobility continues, the limb is crippled for months or years, when at last nature forms a new socket for the end of the bone, and some amount of useful motion is restored. The proper shape of the part is never restored, but remains an eyesore to the patient, and a disgrace to the surgeon.

The general treatment of dislocations consists in their *reduction*, or pulling the displaced bone back into its place. Its return is opposed by the muscles attached to it, which are stimulated to contraction by the pain of the operation, which requires, of course, a good deal of force to be employed. It is desirable to remove this spasm of the muscles, which is the great obstacle to the reduction of a dislocation; and in former days, bleeding from the arm, emetics, the warm bath, etc., were generally made use of; nowadays, chloroform or ether attains the same ends, and renders the treatment of dislocations much more simple and humane than before the introduction of anæsthetics.

When the surgeon is about to reduce a dislocation requiring any degree of force, he fastens the part of the limb above the displaced bone or the trunk, so as to afford him *counter*-extension; he then pulls on the limb either with his hands, or with a bandage or handkerchief attached to it. The best way of fastening this is to roll a bandage, wetted, to prevent slipping, round the limb, and then taking the thing with which he wishes to extend in both hands, he casts it into two loops, forming what is called a *clove-hitch*, and then slips the double noose up the limb till it rests on the wet bandage previously applied. In old-standing cases, the hands grow weary before the extension has been kept up sufficiently long, so it is well to adapt pulleys to draw upon the clove-hitch, as with them the traction can be regulated as the surgeon desires. Sudden, forcible pulling is useless and hurtful, the object being merely to tire out the muscles which resist the attempts at reduction; when they are exhausted, the bone will generally slip back into its place with an audible snap.

A class of shrewd individuals, called "*bone-setters*," frequently derive profit from some conditions of joints which resemble dislocations. Chronic rheumatic inflammation is occasionally known to fix itself by an accident on some particular joint, especially the shoulder or hip, and may so change the surfaces of the bone-ends that they are spontaneously dislocated; the empiric, naturally antagonistic to the regular practitioner, tells the patient that when he met with the accident the dislocation occurred, but that his doctor overlooked it. Again, many persons who have injured their joints do not submit to having them moved about after the first inflammation has subsided. The bone-setter gives a forcible bend to the limb, which breaks up the adhesions; and because he has done roughly what the doctor would have done equally well gently, the patient praises him, while he blames the one who guided his joint in safety through the first effects of the accident.

Whenever a dislocation occurs, the nearest medical man should be summoned, even should the mere displacement be rectified at once, because no such accident can occur without some tearing of the soft parts, and it will depend on the after-treatment whether the joint will ever become useful again or not. It must also be remembered, that the sooner a dislocation is reduced, the easier is the reduction. Since the introduction of anæsthesia, however, and the subcutaneous division of tissues, many ancient cases may be improved, and many crippled limbs restored to usefulness.

DISLOCATION, or **FAULT,** a term used in geology to characterize certain displacements common among stratified rocks. The agency that raised these rocks above the waters of the sea, produced in the elevation numerous rents. In their simplest form,

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the rents are mere cracks, the parts, though separated, remaining contiguous; sometimes a greater or less fissure intervenes between the disunited portions, and this is filled with materials pressed in from above, or with igneous rocks intruded from below. The beds, however, are not always found at the same level—a displacement as well as a severance often takes place, so that the beds on one side of the fissure or crack are many feet, or many hundreds of feet, above or below the beds on the other side with which they were once continuous. One of the best known faults is that called the "Ninety Fathom Dike" in the Newcastle coal-field. The same beds are 90 fathoms lower on the northern than they are on the southern side. The fissure varies in width from a few feet in some places to more than 20 yards in others; it is filled with sandstone. In the Edinburgh coal-field, the greatest fault is the one known as the "Sheriffhall Slip." It has produced a dislocation of the strata to the extent of 400 or 500 ft., so that the coal which is worked on the s. side of the slip, near the surface, is on the n. side 500 ft. below it. Mr. Milne Home enumerates 120 faults in the Mid-Lothian and East-Lothian coal-fields. He has himself examined 78 of these, and has found that 35 dip to the s., and 43 to the n.; and that while the sum of the down-throws by the faults dipping to the s. is 385 fathoms, those dipping to the n. have depressed the strata 754 fathoms.

Faults in coal-fields are well known, because of their serious interference with the progress of the miner. But though they often cause considerable labor and expense in searching for the continuation of a valuable seam of coal, they have corresponding advantages, since they disclose on the surface the value of the buried minerals, and when filled with solid materials, they form embankments which confine water, and thus save considerable expense in draining the mine.

The amount of dislocation is the measure of a line drawn from one part of the bed, at right angles to its plane, to a line produced from the other separated part of the bed representing its plane. Although no notion can be formed, in meeting with a fault, of the extent of dislocation, yet the direction in which the lost strata are to be sought can be certainly determined, for it has been found to be an invariable law, that the strata are lowest on the overlapping side of the slip. Faults have local names from the miners, all of which have been used by geologists. They are called hitches, dikes, troubles, slips, slides, heaves, and throws.

DISMAL SWAMP, formerly measuring 40 miles long by 25 miles wide, lies chiefly in Virginia, but partly in North Carolina. In the center is lake Drummond, covering about 6 sq. miles. Elsewhere the surface is divided between tangled reeds and heavy timber, with a thick undergrowth. This extensive morass has been, at a vast cost, traversed lengthwise by a canal, which connects New Lebanon, in North Carolina, with Norfolk in Virginia, and much of it has been reclaimed.

DISMANTLE is the operation which a ship undergoes when to be laid up in ordinary, or placed out of service. She is unrigged; the rods and most of the ropes are removed; and the upper masts taken down.

DIS'MAS, ST., the name which Catholic tradition has attached to the "good thief." He is represented with a cross beside him.

DISORDERLY HOUSE. For this, see NUISANCE.

DISPART, the difference between the semi-diameter of the base-ring at the breech of a gun and that of the ring at the swell of the muzzle. The dispart sight is a piece of metal cast on the muzzle of a piece of ordnance to make the line of sight parallel to the axis of the bore.

DISPENSARIES.—Hospitals for the treatment of the sick and poor date back to a remote period. The chief object of having hospitals at all, is to supply to the patients admitted a temporary home, where they can receive proper treatment in cases of illness or accident, that could not be had in the patient's ordinary place of abode, either from sanitary defects in the locality or from the want of proper care and food, as well as efficient nursing, especially after operations, etc.

A dispensary is ordinarily defined as a place or institution where medical advice is given and medicines are furnished without charge to the applicant. Those who can afford it have the privilege of paying, but no demand is made. Treatment may be had at the central office or headquarters by any and every one who chooses to apply, and medicines are furnished or treatment may be had at the home of the invalid. Inasmuch as it constantly happens in the crowded parts of a metropolis that the sanitary condition of the homes of the poor is in itself one great cause of the diseases from which the poor suffer, it seems comparatively useless to admit them to a hospital and then send them back, when convalescent, to their crowded rooms, underground cellars, or fœtid apartments, to contract afresh the diseases from which an attempt has been made to rescue them. A system of house to house visitation is often established, and when the houses are found to be filthy, or in any way unfit for human habitation, the proper authorities are called upon to remove the inmates and submit the houses to a proper cleansing. Whitewashing is one of the cleanliest as well as cheapest methods resorted to. In 1687, at a meeting of a faculty of physicians in the city of London, it was resolved to supply the poor with medicines at certain fixed prices. A difficulty arose as to who should be considered "poor," but in 1696 a "deed" or agreement was drawn up and signed by the president, censors, and 50 members of the Medical College, pledging each member

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to assist in maintaining a dispensary that should give aid to all who asked it. In the building erected rooms were fitted up for seeing patients, dispensing medicines, and physicians were appointed who made daily visitations to the homes of the sick poor. This building was the first of a series of similar establishments on an extended scale. Every American town and city at the present time has one or more dispensaries, and treatment is also gratuitously given at the various college clinics. See CLINIC MEDICINE.

DISPENSATION, a license granted by the pope for that which is ordinarily prohibited. The nature and limits of the dispensing power have been the subject of much discussion not only in controversy with Protestants, but among Roman Catholics themselves. It is held by the extreme advocates of papal power, that the pope may dispense in any divine law, except the articles of faith; by others, that his dispensing power does not extend to express precepts of the New Testament; some say that his D. is valid only when it proceeds upon just cause; some, that it is not properly a relaxation of the law's obligation, but merely a declaration that in the particular case the law is not applicable. The usage of the church of Rome, however, agrees with the opinions of her theologians in making the pope supreme in releasing from oaths and vows; and a decree of the council of Trent anathematizes all who deny the power of the church to grant dispensations for marriages within the prohibited degrees of the Mosaic law; whilst the multiplied prohibited degrees of the canon law give much occasion for the more frequent exercise of the same power.—Nothing really of the nature of a D. is known in any Protestant church. The only kind of dispensations now in use in England, are those granted by a bishop to a clergyman, to enable him to hold more benefices than one, or to absent himself from his parish. Formerly, the pope's dispensations in England, as elsewhere, prevailed against the law of the land, not in ecclesiastical matters only, but in all that large department of civil affairs which, by an interested fiction, was brought within the scope of ecclesiastical government. This usage was swept away at the reformation, by 25 Henry VIII. c. 21. The power of the pope was then conferred on the archbishop of Canterbury, in so far as it was not contrary to the law of God. The granting of special licenses of marriage, and the like, is the only form in which it is ever exercised.

In former times, the crown claimed a dispensing power in civil, similar to that which belonged to the pope in ecclesiastical matters. The power was grossly abused by James II., and was consequently expressly abolished by the bill of rights. The privilege of granting pardons in capital cases is the only form in which the dispensing power of the crown still exists.

DISPERSION. Ordinary white light is heterogeneous in its character, being composed of rays of different refrangibility, and the term D. is used in optics to denote the separation of these rays by refraction. Transparent media of various kinds possess different dispersive powers, or, in other words, different powers of widening the angle between the red and violet rays, when a ray of white light suffers refraction through a prism of given angle at a given angle of incidence. The circumstance called the "irrationality of dispersion," consists in the fact, that when a spectrum is measured after Frauenhofer's manner, it is found that the distance between any of the same two fixed lines of the spectrum has not a constant ratio to the distance between the extreme fixed lines, where different media are used. See SPECTRUM. It may be noticed that the word D. is also sometimes used to denote in optics irregular reflection or the scattering of light on imperfectly polished surfaces. See CATOPTRICS. The amount of light not reflected according to the regular law varies with the nature of the reflecting surface. In the case of light incident at right angles upon a surface of common glass, $\frac{1}{13}$ only is properly reflected. In perpendicular reflection at an ordinary silvered looking-glass, about $\frac{1}{4}$ is lost by this sort of dispersion. A little less than $\frac{1}{4}$ is lost in perpendicular reflection from highly polished speculum metal.

DISPLAYED, in heraldic usage, means *expanded;* as an eagle displayed, or what is vulgarly known as a spread eagle. See EAGLE.

DISPOSITION, in art, differs from *composition,* inasmuch as the former has reference to the arrangement of the parts, the latter to the effect of the whole.

DISPOSITION, in music, a term now used in organ-building, adopted from the German, meaning the arrangement and combination of the stops on the different rows of keys and pedals, with the pitch of each stop, or length of the lowest CC pipe.

DISPUTATION. An exercise of logical and dialectic skill in which one party advances an argument and the other seeks to refute it. Challenges to such exercises were often issued—e. g., at Paris in 1577 by the "admirable Crichton." Memorable religious disputations were those between Knox and Kennedy (1562), and between Laud and Fisher the Jesuit (1623) The practice survives as an academic form.

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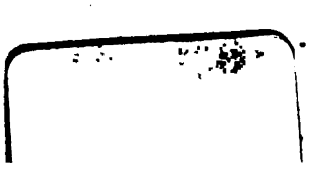
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